

***Attachment C***

***Responses to Comments***

***San Diego Creek/Newport Bay  
Organochlorine Compounds TMDLs***

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

<b>Commenter/Agency</b>	<b>Page Number</b>	<b>Comment/Response Numbers</b>
Flow Science, Inc., <i>DDT Analysis for the Newport Bay Watershed</i> , report dated November 20, 2006. (List, E.J, Paulsen, S. and Mead, A, Flow Science, Inc.; Byard, J.I., Toxicology Consultant; Tjeerdema, R.S., UC Davis; QEA Environmental Consultants, Inc.)	2-3	1
	3-4	2
	4-5	3
	5	4
	5-6	5
	6	6, 7
	6-7	8
	7-8	9
	8-9	10
	9	11
	9-10	12
	10-11	13
	11-12	14
	12	15
	12-14	16
	14	17
	14-15	18
	15	19
	15-16	20
	16	21
	16-17	22
	17-18	23
	18	24, 25
	18-19	26
	19	27, 28

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Comment #1:

The comprehensive literature review and review of newer data presented here [Flow Science report] indicates that under current watershed conditions, relevant wildlife populations are not exposed to levels of DDT that would cause *chronic* toxicity. Available evidence also indicates that organochlorines are not causing *acute* toxicity to aquatic species and wildlife in the watershed at current levels. Recent studies of acute toxicity in San Diego Creek and Newport Bay have concluded that acute toxicity is not caused by organochlorine compounds, but rather is likely attributable to organophosphate, carbamate, or pyrethroid pesticides (Lee and Taylor, 2001; Bay et al., 2004). Given that current DDT levels in the watershed are below levels that cause toxic effects, establishing a TMDL that would further limit DDT loads is unjustified and would be counter to the available scientific information.

Response #1

Regional Board staff acknowledges that some studies indicate that DDT is not likely the cause of acute toxicity in Newport Bay. Board staff's impairment assessment (see "2.0 Problem Statement" in the November 17, 2006 technical report (SARWQCB 2006)) does not rely on findings that DDT or other organochlorine compounds are the cause of acute toxicity.

The Flow Science report does not clearly define the endpoints that are being used in the report to define "chronic toxicity". It appears that the Flow Science report relies on the definition of "chronic toxicity" as critical eggshell thinning (greater than 15%), as apparently recommended by Dr. Byard in Appendix B of the report. Critical eggshell thinning is associated with population decline and reduced hatching success. As detailed in comments provided by experts with the United States Fish and Wildlife Service (USFWS, Zeeman, electronic mail dated February 7, 2007 and USFWS, Kubiak, electronic mail dated February 15, 2007; Attachment E), critical eggshell thinning reflects severe, population-level effects on biota. Impairment assessment and TMDL actions based on this criterion would not be sufficiently conservative to protect against more sensitive effects, such as reduced embryo survival, poor post-hatch survival and developmental abnormalities that affect the ability to breed. In short, application of critical eggshell thinning as an indicator of chronic toxicity is inadequate and inappropriate to assure protection of beneficial uses and compliance with applicable narrative water quality objectives.

In sum, there is no compelling evidence to support the Flow Science report assertion that "current DDT levels in the watershed are below levels that cause toxic effects". In contrast, staff of the USFWS) concluded in their comment letter on the November 17, 2006 OCs TMDLs technical report (see comment letter dated February 28, 2007, Attachment G) that "...DDTr [total DDT] is a potential contaminant of concern for avian species that rely on benthic invertebrates from Newport Bay for food...and that maximum and mean concentrations of DDTr exceed dietary levels of concern for both small and medium-size piscivores. Therefore, we support the determination by Regional Board staff that TMDLs are warranted for DDTr in Newport Bay."

Additionally, impairment assessments conducted by Regional Board staff, USEPA (2002) and the State Board (in consideration of the 2006 Clean Water Act Section 303(d) list of

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

impaired waters) all found impairment due to DDT and other identified organochlorine compounds in Newport Bay and/or its tributary waters. These findings necessitate the development and implementation of TMDLs to address the sources of impairment. The TMDLs recommended by Regional Board staff employ a phased approach and extended compliance schedule to allow for future revision and refinement of the TMDLs if warranted by further investigation. This may include future delisting of one or more pollutant/waterbody combinations if evidence collected during implementation of the TMDLs provides adequate justification for such action.

**Comment #2:**

Review of the scientific studies underlying the numeric DDT concentration targets proposed in the Regional Board's draft TMDL staff report (SARWQCB, 2006)—targets that include sediment threshold effect levels (TELs), fish tissue targets for the protection of human health and wildlife, and water column targets (see Table 1)—indicates that in many important cases the Regional Board's proposed standards are erroneous and scientifically unjustified.

**Response #2:**

The assertion that the proposed TMDL targets are erroneous and scientifically unjustified is not defensible. The "errors" identified in the Flow Science report and appendices are not put into context; numbers of errors or flaws are identified, but are not compared to the scale of the underlying data (are there 70 supposed errors in the DDT TEL dataset out of thousands of data points? Dr. Byard lists 7 errors in Table 16 of the US Department of the Interior (DOI) report; these 7 errors are out of a total of 120 data points from 44 different references). Most importantly, expert commentary provided by Dr. Donald D. MacDonald (MacDonald Environmental Sciences Ltd. (MESL), letter dated February 19, 2007; Attachment I), one of the scientists involved in the development of the sediment quality guidelines (SQGs) relied on by Board staff in formulating the TMDLs, indicates that the "errors" asserted by Dr. Byard are not really errors in the underlying data or in the database but rather appear to reflect differences in the interpretation of the underlying data, differences in the analysis of those data, or differences in the selection of the level of protection that ought to be provided to humans and wildlife (i.e., the selection of numeric targets at which no observable effects are expected vs. numeric targets at the threshold of observable impacts).

Dr. MacDonald provides a detailed critique of Dr. Byard's conclusions and points out that the methods that were used to derive the sediment numeric targets (TELs and the data they are based on) were developed in conjunction with the Science Advisory Group on Sediment Quality Assessment and have been extensively peer-reviewed. The sediment quality guidelines (SQGs) and the methods by which they were derived have been published in the scientific literature. TELs relied upon by Board staff in the proposed TMDLs have been used by various federal and state agencies to support sediment quality assessments. Dr. MacDonald supports the approach proposed in the TMDLs of interim reliance on TELs until data become available to develop site-specific targets.

The National Academy of Sciences (NAS 1972) guidelines were also peer-reviewed and are supported by the 2004 Water Quality Control Policy for Developing California's Clean

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Water Act Section 303(d) List (State Listing Policy). The use of the Office of Environmental Health Hazard Assessment (OEHHA) screening values (Brodberg and Polluck, 1999) for interpreting narrative water quality objectives is allowed by section 6.1.3(2) of the State Listing Policy. The issue regarding screening values was addressed during the development of the State Listing Policy.

In contrast to Board staff's approach, which, again, relies on guidelines identified in or allowed by the State Listing Policy, the arguments and recommendations contained in the Flow Science report and its appendices (prepared to a large extent by Dr. Byard) rely on an alternative approach using guidelines that have not been subject to rigorous scientific review through the peer review process. Reliance on such guidelines would be contrary to the requirements of the Listing Policy. See Section 6.1.3 "Evaluation Guideline Selection Process" of the Policy.

**Comment #3:**

The downward trends in DDT concentrations observed in the Newport Bay watershed must also be considered. According to the most recent data, DDT concentrations have been steadily declining in the Newport Bay watershed for at least 20 years. This decline is evident in data for several different media—particularly fish tissue and mussels, in which the decline is statistically very strong. If no toxic effects due to DDT are observable under current concentrations in the watershed, declines in DDT concentrations indicate that toxic effects will not likely be observed in the future. Further, the Regional Board's use of older data without regressing these data to the present time overstates current DDT levels and leads to erroneous conclusions.

**Response #3:**

Trends alone may not be used to delist or negate the need for TMDLs and data cannot be regressed out but must be based on actual samples (2004 State Listing Policy). The Qualitative Environmental Analysis, Inc. (QEA) memo dated October 3, 2006, which was provided to Flow Science, Inc. and included as Appendix A of their report on DDT (Flow Science, Inc., November 20, 2006; Attachment D), states that "the rate of decline of DDT in the Newport Bay system has slowed over time" with the rate of decline in DDT concentrations in sediment, fish tissue and mussels being greater during the earlier time period reviewed (early 1980s - 1990s). The State Listing Policy also recommends that a trend analysis consider the influence of seasonal effects, inter-annual effects, changes in monitoring methods, changes in analysis of samples, and any other factors deemed appropriate. It is not clear that these have been adequately or appropriately considered in the QEA/Flow Science analysis of contaminant trends in the watershed.

Regional Board staff evaluated OC contaminant trends in sediment, shellfish and fish tissue and recognized that they are significant and declining (Section 2.0 and Figures 2-1 through 2-5, November 17, 2006 OCs TMDLs technical report). Accordingly, Board staff recommended phased TMDLs to allow for refinement and revision over time. The proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process. The proposed implementation plan includes monitoring to evaluate the attenuation process and the efficacy of control actions in the watershed. While natural attenuation has occurred, concentrations of DDT in

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

sediment, mussel and fish tissue data indicate that DDT continues to bioaccumulate in the biota in the watershed.

Board staff disagrees with the premise that “no toxic effects due to DDT are observable under current concentrations in the watershed” (see Response #1). Even if toxic effects are not “observable,” that does not mean that such effects are not present. Assessments conducted by Regional Board staff, U.S. EPA, and State Board staff all found impairment of beneficial uses in the Bay and/or its watershed as the result of DDT and other organochlorine compounds.

Comment #4:

Since their ban, concentrations of organochlorine compounds in sediments, fish, and shellfish from the Newport Bay watershed have declined dramatically, and the mass of these compounds in watershed soils also continues to decline. Recent studies demonstrate that these compounds are not likely to be causing acute toxicity in the watershed; these studies have found that other compounds are likely to be the cause of acute toxicity in the waters and sediments of San Diego Creek and Newport Bay (Lee and Taylor, 2001; Bay et al., 2004).

Response #4:

See Response #1 and #3.

Comment #5:

Despite the widely published conclusion that DDT does not cause mutations or embryo deformities, this issue has been raised by Regional Board staff and an unpublished non-peer reviewed study report funded by the Regional Board (Sutula et al., 2005).

Response #5:

Comment noted. As previously discussed (see Responses 1 and 3), assessments conducted by Regional Board staff, U.S. EPA, and State Board staff all found impairment due to DDT in the Bay and/or its watershed.

The report referenced (Sutula et al., 2005, Organochlorine, Trace Elements and Metal Contaminants in the Food Web of the Light-footed Clapper Rail, Upper Newport Bay, California) has been published by the Southern California Coastal Watershed Research Project (SCCWRP) as Technical Report 467 and is available to download from their web site (<http://www.sccwrp.org/pubs/techrpt.htm>). Outside peer review of this report was provided by Catherine T. Zeeman, USFWS, and by Ben Greenfield, San Francisco Estuary Institute (SFEI). The report states the following: “Observation of minor eggshell thinning and developmental abnormalities [missing lower jaw, abnormally shaped upper jaw and curled toes] in the rail egg with the highest DDE concentration further supports cause for concern that DDTs *may be* causing some degree of reproductive impairment of clapper rails in Upper Newport Bay [emphasis added]. While a combined effect of DDE, Se, and/or other contaminants may be responsible for the deformity, it is not possible to definitively determine the cause. Although organochlorines are known to cause embryo mortality and abnormalities, there is no suite of abnormalities that are characteristic of organochlorine toxicity. However, in the Great Lakes, where elevated levels of persistent organochlorine

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

contaminants (including DDEs and PCBs) were responsible for deformities in aquatic bird species, the most frequently observed deformity was that of the bill, including missing jaws (Fox 2001).”

Comment #6:

Perhaps the most important consideration indicating that the Regional Board’s efforts to establish a TMDL for DDT in the Newport Bay watershed are unjustified is the fact that DDT is not causing toxic effects in the watershed. If DDT is not responsible for toxic effects in the watershed and considering that DDT concentrations will continue to decline naturally in the future, then there is no reason to reduce current DDT loads. In other words, the watershed has the capacity to assimilate current DDT loads and there is no need to artificially reduce loads at this time.

Response #6:

See Responses 1 and 3. Natural attenuation alone cannot be used to delist or to preclude the establishment of TMDLs. The impairment assessment clearly indicates that DDT is continuing to bioaccumulate in organisms at concentrations that may result in direct or indirect adverse effects and that reductions in DDT loads in the watershed are necessary in order to ensure the protection of all beneficial uses.

Comment #7:

To address the concern that wildlife species in the Newport Bay watershed could be exposed to DDE—a metabolite of DDT—concentrations that might harm their reproductive success, an extensive scientific literature review was undertaken to evaluate the current state of knowledge about DDE concentrations in the tissue of key wildlife species, trends in such DDE concentrations, and links between DDE tissue concentrations and reproductive success. The results of this literature review indicate that relevant wildlife populations are not currently exposed to levels of DDE in Newport Bay that are known to cause chronic toxicity, and that the expected continuing declines in DDE concentrations in the environment (due to the ban on its use in 1972) make it highly unlikely that DDE concentrations in wildlife tissue will increase from these nontoxic levels in the future.

Response #7:

See Response #1 and #3.

Comment #8:

The brown pelican is a species particularly sensitive to elevated levels of DDE. DDE residue levels greater than 2.5 ppm in brown pelican eggs have been associated with eggshell thinning in excess of 15 percent and decreased hatching success. As Dr. Byard points out, fish concentrations of 150 ppb DDE should correspond with egg residue concentrations of 1.7 ppm DDE for brown pelicans, which is below the threshold for reduced hatching success. Based on this conclusion, 150 ppb DDE in fish tissue amounts to a fish tissue level that would not reduce brown pelican hatching success. Indeed, after a thorough review of the relevant scientific literature, 150 ppb is the fish tissue concentration that Dr. Byard found to be protective of another sensitive species, the osprey (Appendix C). This fish tissue concentration is three times higher than the 50 ppb criterion proposed in the Regional Board’s recent TMDL staff report (SARWQCB, 2006, Table 3-1). Therefore, the

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Regional Board's proposed numeric target for fish tissue is unjustified, especially considering that brown pelicans do not breed in the Newport Bay watershed.

Response #8:

The logic of this argument is flawed for two reasons: first, by the inappropriate, underlying assumption that a DDT level (slightly) below the threshold for reduced hatching success denotes no adverse toxic effects (see Response 1); second, as was discussed repeatedly with Byard and others during meetings of Board staff's Technical Advisory Committee (TAC) and at the Regional Board workshops and meetings concerning the proposed TMDLs, impairment assessment criteria development properly relies on peer review and consultation and coordination with other agencies, and not on the independent analysis of a single commenter. See also Response 2.

The benchmark of 2.5 ppm DDT in brown pelican eggs referred to in the above comment leaves little room for safety, as it is just below ranges at which significant impacts on nest success have been observed Blus (1984). Dr. Byard suggests that DDE body burdens in pelicans had reached steady state at the time samples were collected in 1974 and that similar to concentrations measured in fish, the concentrations in pelican eggs would have been 27 times lower than those measured in 1969. However, in 1969 DDT concentrations in pelican eggs were approximately 18 times higher than DDT concentrations in the pelican diet. If a fish-to-egg biomagnification factor (BMF) of 18 is used, the DDT concentration measured in fish in 1974 (0.150 ppm) would correspond with a concentration of 2.7 ppm in pelican eggs, which is in the range associated with decreases in nest success (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E). It is irrelevant that brown pelicans do not breed in the Newport Bay watershed; they feed in the watershed and more importantly, the proposed numeric fish tissue target must be protective of all species, including both the most sensitive and more exposed species (such as the endangered California Least Tern). Additionally, the USFWS (Goebel, comment letter dated February 28, 2007; Attachment G) indicates that they believe that the NAS marine guideline for fish tissue of 50 ppb total DDT that is being proposed as a numeric target in the TMDLs may be under protective for small piscivorous birds.

Comment #9:

Cormorants and terns breed in the Newport Bay watershed and are the selected receptors in a sediment-to-wildlife modeling study about to be reported by the San Francisco Estuary Institute (SFEI; B. Greenfield, personal communication, 2006). Therefore, the effects of DDT on cormorants and terns are important for the purposes of assessing potential impacts of DDE in the Newport Bay watershed. Dr. Byard's central conclusion is that DDE residues exceeding 10 ppm in eggs are required before significant DDT-related hatching failure will be observed in cormorant and tern populations. This DDE level results in eggshell thinning of approximately 15% or greater. Insofar as 10 ppm is significantly higher than the 2.5 ppm threshold for the brown pelican, and insofar as that 2.5 ppm threshold corresponds with a fish tissue concentration in excess of 150 ppb, the actual fish tissue threshold for toxic effects in cormorants and terns is likely to be in excess of 600 ppb, much higher than the 50 ppb residue level proposed by the Regional Board.



***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #9:

See Response #1 and #8. If cormorants and terns are indeed less sensitive to DDT effects than other species, they should not be considered appropriate or representative receptors upon which to base criteria for sediment, water or fish tissue (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E). As mentioned previously (see Response #1), hatching success is not considered to be the most sensitive endpoint for all species of birds. Reproductive dysfunction, reduced embryo and post-hatch survival may occur at concentrations below those that result in hatching failure. The selected numeric targets must protect all species, including the most sensitive as well as the most exposed. The criteria must also be conservative to address uncertainty about sensitivities and exposure potential for the species that may be present in the watershed (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E).

Comment #10:

Dr. Ronald Tjeerdema's recent survey of the scientific literature relevant to DDT in marine mammals also supports the conclusion that wildlife species are not, and will not be, subject to harmful levels of DDT and its metabolites (Appendix E). The species Dr. Tjeerdema focused on are as follows: the California sea lion, the harbor seal, the Pacific bottlenose dolphin, the rough-toothed dolphin, the common dolphin, and two filter-feeding baleen whales—the minke whale and the migratory gray whale...given that DDT concentrations are on the decline in the Newport Bay watershed, given that these marine mammals have only a transitory presence in the Bay, and given that DDT accumulation tends to occur in the relatively metabolically inactive blubber tissue of the species (a nontarget tissue), Dr. Tjeerdema found it "unlikely that sufficient concentrations will be accumulated in the region to cause toxic consequences".

Response #10:

Mammals tend to be less sensitive to DDT than birds, and criteria developed to protect against adverse effects in avian species are expected to be protective of mammalian species as well. However, marine mammals such as dolphins and seals, and smaller, land-based mammals that rely on aquatic invertebrates or fish for food (such as raccoons) are likely to be present in the system and should be considered when assessing risk.

Organochlorine pesticides are often found in marine mammal tissues in conjunction with other bioaccumulative contaminants such as PCBs and mercury. Additive or synergistic effects may exist and should also be considered in risk assessments (Schwacke et al., 2002). Organochlorine pesticides and PCBs are known to be endocrine disruptors and biological studies on cetaceans have shown a range of effects linked to these chemicals including immunosuppression, cancer, skin lesions, secondary infections and diseases, sporadic die-offs, and reduced reproductive success (Fossi and Marsili, 2003). While the blubber in marine mammals may be metabolically less active than other organs, mammals are particularly at risk from chemicals that have accumulated in their blubber during periods of fasting, such as during winter, when food is less scarce or the animals are calving, or due to illness or injury. In cetaceans, females impart the majority of their contaminant load to their firstborn calf. Contaminants are also passed to their calves during nursing, and contaminant concentrations in sexually mature females generally decline during both gestation and lactation (Schwacke et al., 2002).

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

It is not currently known what level of risk, if any, may be posed by marine mammals consuming fish in Newport Bay. However, dolphins have been entering Lower Newport Bay more frequently in recent years, so a risk assessment that considers OC effects on marine mammals may be warranted.

Comment #11:

The target concentrations proposed by the Regional Board would appear to require a significant reduction of DDT loads in the watershed (SARWQCB, 2006). As the previous section on toxic effects indicates, current loads are below levels that would cause toxic effects, both acute and chronic, indicating that additional load reductions are unnecessary. In addition, a recent literature review indicates that in several cases the concentration targets proposed for use by the Regional Board are flawed. In other words, not only are these targets not applicable to the Newport Bay watershed at this time (due to the lack of observed DDT-related toxic effects in the watershed), but the targets themselves are scientifically incorrect, and their application would be inappropriate in any context.

Response #11:

See Response #1 and #2.

Comment #12:

The CTR criterion for DDT in water is 1 ppt [parts per trillion] or 0.001 µg/L. This criterion is based primarily on a study by Anderson et al. (1975) of the effects of DDT and its metabolites (particularly DDE) on the reproduction of brown pelicans on Anacapa Island. The 1975 study by Anderson et al. found both that anchovy concentrations were approximately 150 ppb, and that brown pelican reproduction was still inhibited despite almost complete recovery. The EPA used the 150 ppb concentration in northern anchovy—along with several other factors, including a bioconcentration factor (BCF)—to derive the CTR water criterion of 1 ppt. However, as Dr. Byard points out, the study by Anderson et al. also found that the 150 ppb value in anchovy populations represented a 27-fold decline in tissue concentrations since the pre-1972 DDT era. If [brown pelican] egg residue concentrations ultimately would decline at least 27-fold as anchovy concentrations did, then the ultimate geometric mean egg residue DDE concentration would be 1.7 ppm. Insofar as the threshold DDE residue level for hatching success is approximately 2.5 ppm, the 150 ppb anchovy concentration and corresponding 1.7 ppm egg residue concentration are below the threshold for hatching failure in brown pelicans. Thus, the 1 ppt CTR criterion (which is based on the 150 ppb anchovy concentration) likely represents a level below the threshold for brown pelican hatching failure, and therefore represents a NOEL (No Observed Effect Level) for the effects of DDT on wildlife and is below the level of DDT necessary to protect this beneficial use.

Response #12:

See Response #1 and #8. It is inappropriate to assert that DDT levels below hatching failure thresholds denotes a NOEL. It would be inappropriate to make TMDL-related decisions that rely on the recommendations of a single commenter, particularly when these recommendations are not based on peer-reviewed studies and/or are not made in consultation with other appropriate agencies.

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

As indicated in Response 8, DDT concentrations measured in samples from 1974 may not represent steady state conditions. At that time, DDT releases into the environment were ongoing and had been so for decades. In 1969, DDT concentrations in pelican eggs were approximately 18 times higher than DDT concentrations in the pelican diet (Anderson et al., 1975). If a fish-to-egg biomagnification factor (BMF) of 18 is used, the DDT concentration measured in fish in 1974 (150 ppb) would correspond with a concentration of 2.7 ppm in pelican eggs, which is in the range associated with decrease in nest success, making 150 ppb DDT in fish tissue a Low Observed Effects Level (LOEL), as suggested by USEPA (1995), and not a No Observed Effects Level or NOEL (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E).

**Comment #13**

A review of the basis for the currently applicable freshwater and saltwater total DDT sediment TELs—6.98 ppb and 3.89 ppb respectively—indicates that the TELs are flawed, resulting in values that are not appropriate for use in this TMDL. The first problem with the TELs is that they are based on weak and/or erroneous data. For example, some data points underlying the TELs were erroneously interpreted, selected arbitrarily, or “double-counted.” Moreover, some sediment concentrations underlying the TELs—i.e., those derived from water concentrations and sediment-water partition coefficients (e.g.,  $K_{ow}$ 's,  $K_{oc}$ 's)—were based on outdated and incorrect partition coefficients. Also, in some cases low DDT residue data points were used when higher level residue data points were shown to have no effect. As Dr. Byard points out, “If these flaws were corrected, the TEL values would be considerably higher”.

**Response #13:**

See Response # 2. The “errors” identified by Dr. Byard are not errors in the underlying data or in the database but are differences in the interpretation of the underlying data or differences in the analysis of those data. Dr. Byard reviewed the data and information contained in the Biological Effects Database for Sediments (BEDS), that was used to derive the TELs (Dr. D.D. MacDonald, MESL, letter dated February 19, 2007; Attachment E). On the basis of this review, Dr. Byard reported that the data sets for freshwater and marine TELs were found to be erroneous due to many problems with individual data points. Dr. Byard also asserts that some of the sediment concentrations calculated based on the equilibrium-partitioning approach were too low because the “wrong”  $K_{oc}$  value was used in calculating the TEL. The selected partitioning coefficients used to develop these sediment quality guidelines were selected as the values most representative of the central tendency of the values reported in the literature at that time for the sediment data being considered (Hart et al., 1988), which does not make these values “incorrect” or “out of date.” It appears that Dr. Byard did not review in detail the underlying data used to develop the BEDS or replicate the analyses that were conducted (Dr. D.D. MacDonald, MESL, letter dated February 19, 2007; Attachment E); therefore, his assertions may result from a lack of understanding of the decisions that were made regarding the interpretation of individual data sets. The BEDS database represents a compilation of matching sediment chemistry and biological effects data from numerous studies conducted throughout North America (Dr. D.D. Mac Donald, MESL, letter dated February 19, 2007; Attachment E). Over 350 reports were reviewed and critically evaluated. These reports provided information from

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

equilibrium partitioning models, laboratory spiked-sediment toxicity tests, and field studies (i.e., both ambient-media toxicity tests and benthic invertebrate community assessments). The methods used to develop the BEDS database and sediment quality guidelines were developed in conjunction with the Science Advisory Group on Sediment Quality Assessment, which includes nearly 50 experts and practitioners in the sediment quality assessment field. The TELs were derived to provide sediment quality assessment tools that could be used to identify the concentrations of sediment-associated contaminants below which adverse effects on benthic communities are unlikely to be observed (as LOELs or NOELs). This makes the TELs appropriate for use as sediment numeric targets for the protection beneficial uses in the Newport Bay watershed.

Comment #14:

The second problem with the TELs is that they are based primarily on the co- occurrence of toxicity and DDT in sediments, not on dose-response data. In many cases there were numerous other toxic substances present in the sediments used to derive the TELs, which could account for the observed toxicity. In some cases authors of the underlying scientific studies ascribed toxicity to compounds other than DDT and specifically exonerated DDT (Bay et al., 2004). Therefore, the TELs proposed by the Regional Board are flawed and should not be applied in the Newport Bay watershed (or anywhere else). This conclusion is in agreement with the State Board, which does not recommend the use of TELs in their listing policy (SWRCB, 2004, p. 122).

Response #14:

Virtually all of the sediments considered in the evaluations of the reliability and predictive ability of the TELs contained DDTs in complex mixtures with other chemical substances (e.g., metals, PAHs, etc.). Field-collected sediments in the vicinity of urban areas usually contain complex mixtures of contaminants and such mixtures are virtually always more toxic than sediments that contain DDTs alone (Dr. D.D. Mac Donald, MESL, letter dated February 19, 2007; Attachment E). Therefore, the TELs are considered to be conservative and useful tools for identifying sediment quality conditions that are likely to be supportive of healthy, self-sustaining populations of benthic invertebrates in urban embayments that frequently have complex mixtures of various chemicals in the sediments (Dr. D.D. Mac Donald, MESL, letter dated February 19, 2007; Attachment E).

The purpose of the listing policy is to determine impairment or lack of impairment for any given waterbody. The State Listing Policy states under Section 6.1.3 (page 20 of the Policy) the following:

“1. Sediment Quality Guidelines for Marine, Estuarine, and Freshwater Sediments: RWQCBs may select sediment quality guidelines that have been published in the peer reviewed literature or by state or federal agencies. Acceptable guidelines include selected values (e.g., effects range-median, probable effects level, probable effects concentration), and other sediment quality guidelines. Only those sediment guidelines that are predictive of sediment toxicity shall be used (*i.e., those guidelines that have been shown in published studies to be predictive of sediment toxicity in 50 percent or more of the samples analyzed*).” [Emphasis added].

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

As stated above, the sediment guidelines must be predictive of sediment toxicity in 50 percent or more of the samples analyzed in order to determine impairment. The State Listing Policy does not provide guidance on the selection of numeric targets nor does it preclude the use of TELs (or ERLs, NOELs or NOECs) in TMDLs as numeric targets. The purpose of the impairment assessment is to determine the presence of impairment. Numeric targets, however, are selected as goals through which attainment of water quality standards can be met, and are, therefore, often conservative numbers below which only low effects or no effects to organisms are expected.

The OCs TMDLs impairment assessment (Section 2.3 and Appendix B of the November 17, 2006, staff report) used the Probable Effects Concentrations (PECs) developed by MacDonald, Ingersoll and Berger (2000) for freshwater sediments and the Effects Range Median (ERM) concentrations developed by Long and others (1995) and Long and Morgan (1990) for marine sediments (see Tables 2-4 and 2-6 in the November 17, 2006 OCs TMDLs technical staff report). Both the PECs and ERMs for sediment toxicity used in the OCs impairment assessment meet the Listing Policy guidelines (are predictive of sediment toxicity in 50 percent or more of the samples analyzed).

**Comment #15:**

Dr. Byard found that a key report by the Department of the Interior (DOI) (1998) on toxicity thresholds for DDT in avian species contained several errors and serious misrepresentations of published scientific studies. Dr. Byard draws the following conclusion about the DOI report: “At best the report is done incompetently and at worst is an intentional misrepresentation to achieve a higher potency for DDT in avian species than is supported by scientific study.” This conclusion is significant for the Newport Bay watershed since a key report on which the Regional Board depends in establishing regulatory limits for DDT (and which the Board funded)—Sutula et al. (2005)—relies on the DOI findings.

**Response #15:**

It is acknowledged that there are errors in Table 16 in the DOI report Dr. Byard cites, but they do not affect the conclusions concerning effect levels for DDE-associated changes in eggshell quality for cormorants or terns (Ohlendorf, CH<sub>2</sub>MHill, electronic mail dated February 2, 2007; Attachment E). Dr. Byard lists 7 errors in Table 16; these 7 errors are out of a total of 120 data points from 44 different references. It is not clear how these few errors can lead Dr. Byard to conclude that the DOI report was done “incompetently”; additionally, there is certainly no evidentiary basis for the assertion that the report was meant to intentionally misrepresent the DDT data. While cormorants and terns are not among the most sensitive species to the effects of DDT, their eggshell quality and reproductive success has nevertheless been affected. It is cautioned in the DOI report that values presented in summary tables are designed to give only a *general* indication of concentrations that may be troublesome in various types of media. The DOI document is intended to be used as a starting point to help identify possible effect levels that will need to be further researched for each species of concern.

**Comment #16:**

The Regional Board plans to apply in its forthcoming TMDL the 1972 recommendations of the NAS on DDT limits in freshwater and marine fish tissue. The recommendations are

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

1000 ppb and 50 ppb in freshwater and marine fish respectively, and were produced by two separate NAS panels 34 years ago. However, as a recent study by Dr. James Byard demonstrates, these recommendations are flawed in several significant ways. First, the 20-fold difference between the two values is unjustified since both values were based on essentially the same data. Dr. Byard reasons that since both criteria are based on eggshell thinning and reproductive failure in similarly sensitive avian species, the criteria should be similar. Second, Dr. Byard found that the 1972 panels overlooked important information available to them at the time of their recommendations.

**Response #16:**

Board staff recognizes the dated nature of the NAS guidelines and would welcome review of those guidelines using appropriate scientific methods, i.e., consultation with appropriate agencies and parties and independent peer review. As discussed in Response #9, it would be inappropriate to rely on the judgment and opinion of an individual commenter in making TMDL-related decisions. Furthermore, the State Listing Policy supports the use of NAS guidelines.

That said, we provide the following additional response. As we do not have access to all of the data that the different NAS panels used, we cannot judge why different values for freshwater and marine aquatic life were obtained. The freshwater NAS guideline for DDT is applied to both aquatic plants and animals on an individual basis and is less specific in its intent than the marine guideline. The marine NAS guideline for DDT is specific to the piscivorous food web; the guidelines are based on composites of fish in the size range consumed by the birds or mammals of concern. Given the fact that many species of birds, including the endangered California Least Tern, forage in freshwater, estuarine and marine environments, the more conservative of the two NAS guidelines would have to be met at all these locations to ensure protection of those species.

There is also no indication in the data presented by Dr Byard that the NAS advisory panel for marine fish erred in their determination that, *based on the data available to them at the time*, a 50 ppb DDT residue in marine fish tissue would be protective of higher trophic level species (Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007; Attachment E). Dr. Byard states that ospreys tend to feed along coasts and up estuaries resulting in a fish diet quite different from the terns cited in the Hays and Risebrough (1972) study used in the NAS summary. In support of this statement, Dr. Byard cites Green et al. (1983), a study completed 11 years after the NAS Guidance was published in 1972. Dr. Byard also fails to point out that the principal species in the ospreys' diet according to Green et al. (1983), while not the same as the tern prey species, are quite similar in general feeding habits and foraging range (e.g., both the pollock and winter flounder (osprey prey) occur offshore and inshore and can be found in bays and estuaries, which can be said for most of the tern prey species – see Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007 in Attachment E for more details). Therefore, while the list of prey species for osprey and tern from the two different studies are not the same, they are certainly similar enough for the tern prey species to act as surrogates for the osprey prey species. Additionally, all four principal prey species in Green et al. (1983) are marine species which spend most of their lives in the marine environment, entering brackish or freshwater environments only for relatively short periods. Therefore, the osprey studied by Green et al. (1983) had a predominantly marine

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

fish diet and were appropriately used to establish the marine NAS guideline (Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007; Attachment E).

Comment #17:

Third, the NAS panel's recommendations do not incorporate results from the abundant study of this topic which has been conducted in the over 30-year period since 1972. Dr. Byard concludes that the guidance for DDT in fish tissue ought to be 150 ppb for marine species. He notes that a 150 ppb guidance value would be consistent with the current CTR criterion for DDT in water, which is based on a 150 ppb DDT concentration in fish, a concentration which he estimated to be below the threshold for reproductive toxicity in the DDT-sensitive brown pelican. Insofar as the Regional Board staff's proposed 50 ppb target for marine fish tissue is one-third of this 150 ppb value, the board's value is unjustified. Conversely, the freshwater value of 1000 ppb proposed by Regional Board staff seems too high and likely is not adequately protective of sensitive avian species.

Response #17:

See Response #8 and #16. This and prior comments in the Flow Science report and its appendices continue to assume that Board staff can and should make TMDL-related decisions based on the analysis and recommendations of Dr. Byard, though neither the analysis nor recommendations have been subject to review and discussion through a peer review process or publication in scientific journals. This assumption is quite simply incorrect. As Board staff has repeatedly indicated to Dr. Byard and other stakeholders, the requisite scientific peer review would be welcome. While the studies Dr. Byard cites to support his higher fish tissue DDT concentration of 150 ppb clearly show an increase in osprey populations, the variability in fish and egg chemistry cause them to be equivocal with regards to a protective fish tissue concentration (Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007; Attachment E). Even if the data presented by Dr. Byard supported a change in the recommended protective fish tissue levels for osprey, it would still need to be determined that the higher level of 150 ppb recommended by Dr. Byard was still protective for all or at least most species, since the original recommendation used the osprey as a surrogate for all fish eating species. However, exposure factors based on the osprey may not be protective of smaller more exposed species (e.g., California Least Tern) in the same feeding guild (smaller birds such as terns, consume more fish per body mass than larger birds such as osprey), so review and revision of the data might actually result in lower levels than the current NAS guidelines. This type of review and determination is best done by a panel of experts followed by extensive peer review (Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007; Attachment E).

Comment #18:

In 2000, Environment Canada published a fish tissue total DDT residue guideline (TRG) aimed at protecting fish-eating avian species from the reproductive effects of DDE, a DDT metabolite (Environment Canada, 2000). The published TRG was 14 ppb. However, Dr. Byard concludes that the TRG was based on several questionable assumptions that led to an erroneous value that is too low (see Appendix G). First, Environment Canada selected two species of duck—the mallard and the black duck—as the test species for formulating the TRG. However, neither species of duck normally eats fish; both are primarily herbivores. Thus, it does not make sense to use these duck species as models for the

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

effect of DDE in fish on avian species. Rather, Environment Canada should have used at least a carnivorous species such as the American kestrel (sparrow hawk), which is sensitive to the reproductive effects of DDE, and for which excellent dose-response data regarding eggshell thinning, DDE residue in eggs, and hatching failure are readily available.

**Response #18:**

Dr. Byard's comments pertain to details in the Environment Canada protocols used for developing the Canadian fish tissue guideline for wildlife. The guideline is based on a NOEL for eggshell thinning in ducks, combined with the food ingestion rate for a storm petrel. Such protocols incorporate both technical observations and policy considerations. It is desirable to base criteria on NOELs for sensitive receptors in general. The daily exposure rate used to represent the NOEL for effects in ducks was stated to be the lowest found, suggesting that the duck is a sensitive avian receptor. Whether or not a raptor should be used instead can only be determined by making between species comparisons for the same level of effect (e.g., thinning versus critical thinning) and measures of exposure that adjust for receptor size (e.g., as mg DDT/kg BW per day). (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E).

**Comment #19:**

Second, Environment Canada chose to use eggshell thinning, not hatching failure, as the toxic endpoint upon which to evaluate the reproductive effects of DDE on avian species. However, it is widely recognized that eggshell thinning below the threshold for hatching failure is not detrimental to avian wildlife, and thus is not known to be a toxic endpoint (Appendix G). Instead of eggshell thinning, Environment Canada should have used hatching failure, the most sensitive toxic endpoint for chronic DDE exposure in birds.

**Response #19:**

Eggshell thinning is an effect of DDE exposure, and an agency may elect to consider any amount of thinning as the adverse effect of concern (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E). Using hatching failure as the measure of an effect (as suggested by Dr. Byard) may be imprudent; criteria based on such severe effects may not protect against other sensitive effects. Any amount of eggshell thinning may be considered an adverse effect for species that are particularly susceptible to DDT-related eggshell thinning (Zeeman, USFWS, electronic mail dated February 7, 2007; Attachment E).

**Comment #20:**

Third and finally, Environment Canada chose to assume in their TRG calculations the daily food intake rate of the Wilson's storm petrel. This choice was inappropriate since fish make up only a minor part of the Wilson's storm petrel diet, and since petrels have been shown to be less sensitive to the reproductive effects of DDE than species such as the osprey, the brown pelican, and the peregrine falcon. Instead of the food intake rate of the Wilson's storm petrel, Environment Canada should have used the intake rate of the osprey, a fish-eating species that both is sensitive to DDE and has a relatively high daily food intake rate. As Dr. Byard has noted, if appropriate assumptions described here had been used, Environment Canada would have calculated a TRG of 250 ppb, a value 18 times higher



***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

than the value published in 2000 (Appendix G, p. 7). Thus, the Environment Canada value is wrong and inappropriately low.

Response #20:

The exposure factors for the storm petrel represent exposure factors for small piscivorous birds. Using exposure factors for the osprey, as recommended by Dr. Byard, would be inappropriate for systems that support smaller species with the same feeding habits (e.g., California Least Tern).

Comment #21:

This conclusion [that the Environment Canada values are wrong and inappropriately low] is relevant to the Newport Bay watershed organochlorine TMDLs insofar as the Regional Board included the Environment Canada value in Table 2-4 of the organochlorine staff report (SARWQCB, 2006), suggesting that the Board may use it as a screening value for fish in the watershed. Given the conclusion that the Environment Canada value is flawed, any such use by the Regional Board would be inappropriate.

Response #21:

Regional Board staff did not use the Environment Canada values for either the OCs TMDLs impairment assessment or as numeric targets for DDT. Regional Board staff do not agree however, that the Environment Canada value for DDT is flawed (see Response #16).

Comment #22:

In 1991, the California Office of Environmental Health Hazard Assessment (OEHHA) published a guidance report on sport fish consumption in Southern California (Pollock et al., 1991). The guidance has been updated various times for other areas of the State. Dr. Byard points out that the Santa Ana Regional Board staff have misinterpreted the OEHHA fish guidance for total DDT to claim impairment of sport fishing in Newport Bay. The OEHHA guidance cautions against using the recommended 100 ppb OEHHA target as a standard. The objective of the OEHHA guidance was to achieve a potential cancer risk of less than 1/10,000 (less than 1,000 ppb) at each site. This objective is met in Newport Bay. The guidance states that the linear dose extrapolation procedure used to estimate cancer risk likely overestimates the actual risk. Studies confirm that DDTs (DDT, DDE and DDD) are not genotoxic and produce cancer in rodent livers by a threshold-promoting activity. This understanding was part of the original FDA action level of 5,000 ppb in commercial fish. Dr. Byard also points out that OEHHA recently has issued new draft guidance that sets the fish fillet screening level at 560 ppb total DDT. The new guidance uses the 1/10,000 cancer risk level and considers the decay of DDTs in the environment. This new guidance is also met in Newport Bay (Appendix H). Dr. Byard concludes that DDTs are not impairing sport fishing in Newport Bay.

Response #22:

In the OCs TMDLs staff report (SARWQCB 2006), OEHHA human health screening values (SVs) were used to assess water quality impairment and also serve as fish tissue targets for the protection of human health as there are no regulatory numeric criteria for fish tissue. Numeric targets are goals, not standards. To assess whether the narrative water quality objective for protection of human health is being achieved, fish fillet concentrations were

***Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

compared to OEHHA human health risk screening values in the OCs TMDLs impairment assessment. The screening value approach identifies chemical contaminants in fish that occur at concentrations that may be of concern to human health for frequent consumers of sport fish. These values are not meant to be regulatory criteria, but instead are used to reveal where the need exists for further investigation. Consistent with the State Listing Policy, exceedances of OEHHA SVs are being used as thresholds to indicate that contaminants have bioaccumulated in fish tissue to levels that may be of concern to human health and that threaten to violate the first narrative water quality objective. The use of the OEHHA SVs for interpreting narrative water quality objectives is allowed by section 6.1.3(2) of the State Listing Policy. The issue regarding screening values was addressed during the development of the State Listing Policy.

The State Listing Policy precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft SVs for DDT (560 ppb) because there is no guarantee that draft SVs will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I). CTR human health criteria are based on a  $10^{-6}$  cancer risk factor, while OEHHA SVs are based on a  $10^{-5}$  cancer risk. As an alternative to using OEHHA SVs, fish tissue endpoints could be back-calculated from CTR human health criteria, as was done by the Los Angeles RWQCB for the Calleguas Creek OC Pesticides and PCBs TMDLs. If this method is used, for DDT the allowable Threshold Tissue Residue Level (TTRL) in muscle fillet would be 32 µg/kg wet weight, which is less than the OEHHA SV of 100 µg/kg ww. USEPA has concluded that FDA action levels do not provide as great a level of protection for consumers of fish and shellfish caught and consumed than do human health criteria.

Comment #23:

The proposed establishment of a TMDL for DDT by the Regional Board is inappropriate for another reason—the statistically strong downward trends in organochlorine concentrations in the Newport Bay watershed. Rather than incorporating these trends into their analysis, the Regional Board is relying upon data that are in many cases five to ten years old, and has failed to project well-established trend data to the present time. Insofar as toxic effects caused by DDT are not observed in the watershed under current loadings, toxic effects due to DDT are highly unlikely in the future given the observed and projected decline of DDT concentrations over time. According to the most recent data, organochlorine concentrations have been steadily declining in the Newport Bay watershed for at least 20 years. This decline is evident in data for several different media—particularly fish tissue and mussels, in which the decline is statistically very strong.

Response #23:

The State Listing Policy does not establish age limitations on data. All data must be considered, even older data. Trends alone may not be used to delist or negate the need for TMDLs. Regional Board staff evaluated trends, recognized that they are significant and declining, and recommended that monitoring of natural attenuation be continued. However, page 4 of Appendix A (Qualitative Environmental Analysis [QEA], Inc., memo dated October 3, 2006) of the Flow Science report states that “the rate of decline of DDT in the Newport Bay system has slowed over time” with the rate of decline in DDT concentrations in sediment, fish tissue and mussels being greater during the earlier time period reviewed

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

(early 1980s - 1990s). The collection of trend monitoring data (through the State Mussel Watch [SMW] and Toxic Substances Monitoring Programs [TSMP]) for the watershed was discontinued by the State in 2001. Beginning in 2006, funding was obtained by Regional Board staff to reinstate trend monitoring in the watershed for at least 3 years. This information will provide data that can be used to determine if the declining trends in the organochlorine compounds are continuing and whether or not concentrations in these media have declined sufficiently to warrant pursuit of delisting for these contaminants.

**Comment #24:**

The available sediment data for Newport Bay are not reliable indicators of bioavailable DDT concentration trends in the watershed and should not be used independent of all other available data.

**Response #24:**

There is a strong linear relationship between 4,4-DDE concentrations in *Macoma nasuta* (clam) and 4,4-DDE concentrations in sediment from Upper Newport Bay. These data reveal that OC pollutants are clearly bioavailable in Newport Bay sediments. However, sediment data were not considered independent of other available data. Sediment chemistry data were used in conjunction with benthic community data, fish tissue, and mussel tissue data for the impairment assessment. See Table 2-6 in the OCs TMDLs November 17, 2006 technical staff report (SAWRCB 2006).

**Comment #25:**

DDT removal from soils tends to be non-linear, and thus the first 50% of the DDT tends to be removed from soil more quickly than subsequent halves. In other words, the half-life of a given quantity of DDT may decrease over time. If we conservatively assume a half-life of 20 years for DDT in soil, given that the use of DDT was banned in 1972 and excluding other loss or removal mechanisms, the mass of DDT in the agricultural soils of the Newport Bay watershed would have declined by at least 60% over the past 34 years due solely to natural removal. As noted previously, the empirically established concentration declines in Red Shiner and Mussels amount to DDT half-lives in tissue from those two species of 3.8 years and 5.2 years respectively, suggesting that the percentage of DDT removed from the watershed as a whole since 1972 may be much higher than 60%. Natural removal likely explains at least part of the empirically established concentration declines in Red Shiner, Mussels, and other key media presented previously.

**Response #25:**

Regional Board staff acknowledges that natural attenuation is occurring in the watershed. However, as stated previously in Response 3, trends alone cannot be used to delist a waterbody for contaminants.

**Comment #26:**

This link between development and sediment load reductions suggests that development in the watershed has and will continue to reduce the amount of DDT available to biota in the watershed. The extent of land-use change in the watershed in the recent past is significant. In 1983 agricultural uses accounted for 22 percent of the Newport Bay watershed while urban uses accounted for 48 percent. In 1993 agricultural use had

**Attachment C1A – Response to Flow Science, Inc. Report on DDT  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

declined to 12 percent of the watershed while urban use had increased to 64 percent. As of 2000 agricultural uses had dropped to approximately 7 percent of the watershed. Given this established land-use trend [declining agricultural land use and increasing urban land use], it is reasonable to expect the continued reduction of DDT concentrations in the watershed.

Response #26:

Comment acknowledged.

Comment #27:

Dicofol does not represent a significant source of DDT in the watershed.

Response #27:

Regional Board staff concurs. The November 17, 2006 OCs TMDLs technical staff report (SARWQCB 2006) states the following on page 47: “Because dicofol contains only very small amounts of DDT and because its use has declined dramatically, dicofol is considered to be an inconsequential continuing source of DDT in the watershed.”

Comment #28:

Non-resident fish—fish that ordinarily spend significant portions of their life-cycle outside Newport Bay—will not be good indicators of organochlorine levels in the Newport Bay watershed, insofar as such species could have accumulated organochlorines in their tissue at ocean locations outside the Bay. Until it is established that a particular fish species is a year-round resident of the Bay, and thus is not subject to organochlorine sources outside the Newport Bay watershed, it is not scientifically justifiable to infer the presence of organochlorine compounds in the watershed from the presence of such compounds in the tissue of the particular species.

Response #28:

While findings of impairment are most conclusive when pollutant concentrations in *resident* fish species are evaluated (rather than concentrations in *transient* fish), the OCs TMDLs impairment assessment evaluated all fish tissue data and did not preclude a finding of impairment based on non-residency. There is a substantial amount of uncertainty when evaluating concentrations in fish whose home range includes areas outside of the Bay. Pollutant concentrations in transient species captured within embayments could reflect the pollutant concentrations of either in-bay or offshore waters, depending upon the amount of time spent in each area. With some fish species, however, it is not known with certainty whether they are resident or transient. Disregarding certain data because residency cannot be established with certainty could lead to erroneous conclusions. During implementation of these TMDLs, indirect effects due to bioaccumulation and biomagnification will be better evaluated, and the appropriate target species and protective tissue concentrations for those species will be identified (November 17, 2006 OCs TMDLs technical staff report).

**Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Commenter/Agency	Page Number	Comment Numbers
Flow Science, Inc., October 20, 2006 CHLORDANE Analysis for the Newport Bay Watershed (List, E.J; Paulsen, S.; Mead, A; Byard, J.I.)	2	1
	2-3	2
	3-4	3
	4	4
	4-5	5
	5	6
	5-6	7
	6	8, 9
	7	10, 11
	7-8	12

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #1

In the Draft Organochlorine TMDL document, the Regional Board claims that chlordane is causing acute toxicity in Newport Bay. As evidence, they point to the fact that sediment chlordane concentrations exceed the effects range median (ERM) for chlordane in sediments, and to the fact that chlordane is present in sediments that are toxic to benthic organisms. However, as Dr. James L. Byard points out (appendix to Flow Science report), there are several problems with this evidence which undermine the Regional Board's claim that chlordane is responsible for toxicity in the Bay. The data set used in formulating the chlordane ERM is flawed, resulting in an ERM that is far lower than the actual toxicity threshold for benthic organisms due to chlordane in sediments. For example, several data points were calculated using outdated partition coefficients, and other data were gathered using techniques that are inappropriate for assessing sediment toxicity. If valid data were used, the ERM would be considerably higher and would be greater than the observed chlordane concentrations in Newport Bay sediments. Thus, compared to a valid ERM, the sediments in Newport Bay are not toxic for chlordane.

Response #1

The November 17, 2006 OCs TMDLs technical staff report does not claim that "chlordane is causing acute toxicity in Newport Bay." The report states that the results of the impairment assessment indicate that chlordane *may* pose a threat to benthic invertebrates and that concentrations could be causing a violation of the second narrative water quality objective for toxic substances (see Section 2.4.2 of the staff report).

An ERM (Effects Range Median) is the 50<sup>th</sup> percentile on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect (O'Conner, 2004). The purpose of an ERM is to infer associations between chemical contaminants and adverse biological effects, and as a framework for follow-up research and monitoring. The ERM is interpreted as the point above which adverse effects are expected.

Dr. Byard's assertions that the ERMs are flawed due to 'out-of-date' partitioning coefficients and 'inappropriate' data gathering techniques have not been substantiated by others. The arguments and recommendations contained in the Flow Science report and its appendix prepared by Dr. Byard have not been published or subjected to rigorous scientific review through the peer review process. Reliance on such recommendations would be contrary to the requirements of the 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy, see Section 6.1.3 "Evaluation Guideline Selection Process" of the Policy). The ERMs developed by Long and Morgan (1990), which were utilized in Board staff's impairment assessment, have been published and subjected to scientific peer review as required by the State Listing Policy.

Comment #2

The SA RWQCB's claim that chlordane is causing toxicity to benthic organisms is partially based on a study by the Bay Protection and Toxic Cleanup Program (BPTCP). Based on this study, the SA RWQCB concluded that there is a correlation between sediment chlordane residues and both the inhibition of larval development in purple sea urchins and the disruption of benthic communities in the Bay. However, contrary to the SA RWQCB's

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

conclusion, the BPTCP study did not in fact document these findings, and thus that report does not support the SA RWQCB's claim that chlordane is causing benthic toxicity.

**Response #2**

The BPTCP report (1997) states that "Analyses revealed significant negative correlations between chemicals of concern and amphipod toxicity in specific water bodies" and references Table 24, which lists total chlordane as being significantly correlated with amphipod toxicity in Newport Bay. Table 25 lists total chlordane as significantly correlated with purple sea urchin development and Table 28 lists four sites within Newport Bay as having degraded benthos. Table 30 lists the results of the Principle Components Analysis and lists chlordane for factors correlated with a biological indicator (urchin development) and as exceeding the ERM guideline value. While the BCTCP does not explicitly state that chlordane is the definitive cause of this toxicity or benthic degradation, the statistical correlations listed indicate that chlordane may be contributing to toxicity and/or benthic degradation in Newport Bay.

**Comment #3**

The SA RWQCB cites the fact that chlordane is present in Bay sediments found to be toxic to amphipods as evidence that chlordane is causing the observed toxicity. However, as Dr. Byard points out, the observed correlation between chlordane concentration and toxicity does not necessarily indicate a cause-effect relationship between the two factors. In fact, dose-response bioassays in amphipods and more sensitive aquatic species indicate that chlordane concentration thresholds that result in toxicity to the most sensitive aquatic species are well above the highest levels of chlordane reported by SA RWQCB for Newport Bay sediments. Moreover, several recent studies of acute toxicity in the Bay have concluded that it is unlikely that organochlorine compounds are responsible for observed toxicity, and that organophosphate pesticides, such as diazinon and chlorpyrifos, and possibly pyrethroids are more likely the toxic agents (Lee and Taylor, 2001; Bay et al., 2004).

**Response #3**

Section 2.4.2 of the November 17, 2006 OCs TMDLs technical staff report states that the data indicate that chlordane may pose a threat to benthic invertebrates and violate the second narrative water quality objective for toxic substances in the Regional Board's Basin Plan. The staff report also acknowledges that the organochlorine compounds are not causing acute toxicity in the Bay. The OCs TMDLs impairment assessment used Long and Morgan's (1990) ERM for chlordane as a sediment quality evaluation guideline as part of the multiple weight of evidence approach (sediment triad approach), in accordance with the State Listing Policy recommendations. Sediment quality guidelines, such as ERMs, do not provide a basis for identifying the substance or substances that caused an effect in field-collected samples, but instead define contaminant concentrations that are usually associated with adverse effects (MacDonald, 1994). Exceedance of the ERM for a certain substance indicates that the chemical may be, in part, responsible for the observed effects; however, confirmation of the role of individual chemicals that occur in complex mixtures in sediments requires the use of toxicity identification evaluation procedures (TIEs) or toxicity tests using sediments that have been spiked with individual chemicals or contaminant mixtures to establish dose-response relationships.

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The exceedance of the ERM and finding of impairment for total chlordane indicates that chlordane may be one of the chemicals responsible for the sediment toxicity observed in the Bay. Multiple chemical mixtures in sediments are very often additive; while chlordane may not be the direct cause of the observed toxicity, it is likely that it is at least a contributing factor. Implementation actions taken to reduce chlordane concentrations in sediments will likely result in the reduction of other pollutants present in the sediments that may be causing or contributing to sediment toxicity in the Bay.

It may be noted that the EPA came to a similar conclusion with respect to the effects of chlordane, based on an independent impairment assessment (USEPA 2002). Accordingly, EPA promulgated chlordane TMDLs for Newport Bay and San Diego Creek in 2002.

**Comment #4**

Insofar as observed chlordane concentrations in Newport Bay do not exceed a scientifically defensible ERM value, and insofar as it is highly unlikely that chlordane is responsible for observed sediment toxicity, there is no basis in sediment toxicity for the proposed chlordane TMDL.

**Response #4**

In accordance with the State Listing Policy, the finding of impairment for total chlordane for both Upper and Lower Newport Bay was based on a multiple weight-of-evidence (sediment triad) approach that included sediment chemistry, benthic community degradation and toxicity, not toxicity alone. Therefore, TMDLs for total chlordane are warranted. Further, as stated in Response #1, the “scientifically defensible” ERM recommended by Dr. Byard and relied on in the Flow Science report has not been subjected to peer review. Thus, it cannot serve as the basis for impairment decisions, pursuant to the State Listing Policy.

**Comment #5**

In the draft organochlorine TMDL report, the SA RWQCB proposes to use the guidance tissue level for chlordane in California sport fish published by the Office of Environmental Health Hazard Assessment (OEHHA) as the governing standard for fish tissue concentrations in the watershed. The OEHHA value for chlordane is currently 30 ppb. However, OEHHA is in the process of revising this value. The OEHHA draft report entitled “Development of Guidance Tissue Levels and Screening Values for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene” (February 2006) lists a revised guidance level of 200 ppb for chlordane. This revised value of 200 ppb represents OEHHA’s most up-to-date assessment of human health hazards related to fish tissue consumption. If an OEHHA value is to be used to regulate fish tissue concentrations in the watershed—a regulatory role which OEHHA values were never intended to play— 200 ppb should be used, not 30 ppb as the draft organochlorine TMDL proposes.



***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #5

The State Listing Policy precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft screening values because there is no guarantee that draft screening values will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

Comment #6

Since 1987 not a single fish tissue sample from the Bay for any species has exceeded a chlordane concentration of 200 ppb. In fact, in the entire record of fish tissue chlordane concentration data, only three red shiner samples from San Diego Creek (out of 169 total samples for all species) exceeded 200 ppb, and these exceedances occurred in 1984 and 1987, prior to the ban on chlordane. Furthermore, if it is considered that red shiner are not generally consumed by humans—they are generally a bait fish—this means that data for typically-consumed fish species have never exceeded the revised OEHHA value during the period of record in the Newport Bay watershed, including samples before chlordane's ban. Finally, it is notable that the vast majority of the most recent fish tissue samples (e.g., from 2000 to 2002) yielded chlordane concentrations below analytical detection limits. Together, these considerations suggest that a TMDL is not necessary for the purposes of reducing chlordane concentrations in fish species inhabiting the Newport Bay watershed.

Response #6

See Response #5. Fish tissue concentrations cannot be compared to the draft OEHHA screening values until those values have been determined to be final and published as such. Additionally, staff did not compare red shiner tissue data to the 1999 OEHHA human health screening values as those values can only be compared to muscle fillets from finfish (fish that humans are likely to consume). The impairment assessment for chlordane for Upper and Lower Newport Bay was based on the sediment triad approach (sediment chemistry correlated with sediment toxicity and/or biologic community degradation), not fish or mussel tissue data. As described in the November 17, 2006 OCs TMDLs technical staff report, the impairment assessment for San Diego Creek did not show impairment due to chlordane. However, in light of the finding of chlordane impairment in Newport Bay and the fact that San Diego Creek is the predominant source of inflows to the Bay, an informational TMDL for chlordane for San Diego Creek is recommended.

Comment #7

In the case of the red shiner, chlordane tissue concentrations dating from 1983 show a substantial decline over time. Red shiner tissue concentrations may be taken as an indicator of chlordane concentrations in the watershed, as red shiners are local, short-lived species. The downward trend observed in the complete data set (1983-2000) is not simply the result of a temporally localized effect, but rather is an accurate portrayal of declines in chlordane concentrations over the entire period. The decay rate (-0.00046 per day or -0.17 per year) obtained for the full red shiner dataset (1983-2000) is equivalent to a half-life of 4.1 years.

Response #7

Trends alone may not be used to delist or negate the need for TMDLs. Regional Board staff evaluated trends, recognized that they are significant and declining, and

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

recommended that monitoring of natural attenuation be continued. The collection of trend monitoring data (through the State Mussel Watch [SMW] and Toxic Substances Monitoring Program [TSMP]) for the watershed was discontinued by the State in 2001. Beginning in 2006, funding was obtained by Regional Board staff to reinstate trend monitoring in the watershed for at least 3 years. This information will provide data that can be used to determine if the declining trends in the organochlorine compounds are continuing and whether or not concentrations in these media have declined sufficiently to warrant pursuit of delisting for these contaminants.

**Comment #8**

Like red shiner data, mussel tissue data from Newport Bay show decreasing chlordane concentrations dating to 1980. A split analysis was also performed on mussel data for the two periods 1980 to 1989 and 1990 to 2000. This split analysis revealed that neither the earlier ( $R^2 = 0.1176$ ) nor the later period ( $R^2 = 0.2968$ ) evidence as statistically strong a decline as the complete period. Nevertheless, the most important conclusion is that when the entire mussel data set (1980-2000) is considered, it reflects a statistically significant decline in chlordane tissue concentrations, and is equivalent to a half-life for chlordane of 6.2 years (decay rate of -0.00031 per day or -0.11 per year).

**Response #8**

See Response #7.

**Comment #9**

It is difficult to infer Bay-wide trends in sediment chlordane concentration over time from these data for several reasons. First, sampling was conducted by multiple agencies, using multiple methodologies, at varying locations and sample depths. Second, there is significant movement of sediment into, out of, and within the Bay and its watershed such that even samples taken in the same location at two different times may not represent the change in chlordane concentration for a specific quantity of sediment. Third, sediment concentrations in Newport Bay may be more indicative of chlordane loads from years or decades past, since Bay sediments are transported from the upper watershed in a highly variable, episodic manner, correlated with storm events and wetter-than-average rainfall years. For all these reasons, the available sediment data for Newport Bay are not the most reliable indicators of bioavailable chlordane concentration trends in the watershed. However, it is still notable that since 2002 all 22 Bay and creek sediment samples have exhibited chlordane concentrations below an analytical detection limit of 25 ppb (or  $\mu\text{g/kg}$ ).

**Response #9**

Sediment chemistry alone was not used to determine impairment. The State Listing Policy requires that a sediment triad approach be used to determine impairment in sediments. The State Listing Policy recommends the use of sediment quality guidelines (SQGs) to show the association between toxicity/biologic community degradation and a given pollutant.

An analytical detection limit of 25 ppb for chlordane is above both the impairment assessment ERM of 6 ppb and the TMDL sediment numeric target of 2.26 ppb. Therefore,

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

the sediment samples referenced in Comment #9 cannot be used to determine whether or not the ERM or TMDL numeric targets were exceeded.

Comment #10

Only 12 chlordane water concentration data points were available for the Newport Bay watershed. Table 3 summarizes these data. All data were collected in 2001 or 2002, and none of the data points were above the analytical detection limit of 1 ng/l. The CTR human health regulatory threshold for chlordane in water is 0.00057 µg/L, or 0.57 ng/L.

Response #10

Chlordane, like other organochlorine pesticides, is highly hydrophobic. Therefore, it is not surprising that chlordane concentrations were not detected in the water samples. These data do not suffice to demonstrate a lack of impairment.

Comment #11

Agricultural soil chlordane data were available for the Newport Bay watershed for the years 1989, 1990, 1995, and 2004. Samples from different years were taken in different locations since the purpose of sampling was generally to assess site conditions for planning and development, not to establish concentration trends over time in the watershed. From these data, it is clear that nearly all chlordane in agricultural soils within the watershed has been removed by volatilization, and the mass of chlordane in watershed soils is so low as to be uniformly below detection limits.

Response #11

The majority of the analytical testing limits used to determine chlordane concentrations in the agricultural soils were above the SQGs used to assess impairment. While much of the chlordane in the soils in the watershed may have been removed by volatilization or transportation into surface waters by erosion and sedimentation, the remaining soils should be tested using analytical methods with detection limits that are below the chlordane TMDL sediment numeric target (2.26 ppb) to determine whether, and to what extent, these soils may threaten water quality.

Comment #12

The half-life of chlordane in soil is estimated at 350 days (or approximately 1 year), but can range from 37 days to 3500 days (approximately 10 years) (Hornsby et al., 1996). Chlordane is persistent in soils and volatilization is believed to be the only major removal mechanism (U.S. Dept. of Health and Human Services, 1994). Given that the use of chlordane was banned in 1988, and assuming a half-life of 10 years and no other loss mechanisms, the mass of chlordane in the agricultural soils of the Newport Bay watershed would have declined by almost 75% over the past 18 years due solely to volatilization. If the half-life is assumed to be one year, the decline of chlordane mass in agricultural soils would effectively be 100%. As noted above, the red shiner and mussel data can be used to estimate the half-life of chlordane in the watershed, as chlordane concentrations in their tissues are direct measures of their exposures. These data indicate a chlordane half-life in the watershed of between 4.1 years (obtained from red shiner data) and 6.2 years (obtained from mussel data), well within the range of published data on the half-life of chlordane in the environment. Assuming a half-life of 5 years, as suggested by observed

***Attachment C1B – Response to Flow Science, Inc. Report on Chlordane  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

declines in red shiner and mussel concentrations, the decline of chlordane mass in agricultural soils in the watershed would be approximately 90%.

Response #12

See Responses #7 and #11.

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Commenter/Agency	Page Number	Comment Numbers
Flow Science, Inc., November 13, 2006 TOXAPHENE Analysis for the Newport Bay Watershed (List, E.J; Paulsen, S.; Mead, A; Byard, J.I.)	2	1, 2
	3	3
	3-4	4
	4	5, 6
	4-5	7
	5	8, 9
	6	10, 11
	6-7	12
	7	13

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #1**

The Regional Board proposes to use a sediment screening concentration for toxaphene of 0.1 ug/kg (0.1 ppb). This screening value was published by the New York State Department of Environmental Conservation in 1998. Given Regional Board estimates of current toxaphene loads in the Newport Bay watershed, and a loading capacity based on the New York State sediment screening value, a 99% reduction in toxaphene load would be required under the proposed TMDL. Since almost all of the toxaphene in the watershed is bound to sediment, the TMDL would effectively require a sediment load reduction of 99%, to achieve the toxaphene load reduction.

**Response #1**

Staff recognizes that accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging. Compliance with the Sediment TMDLs is expected to substantially help to reduce organochlorine compounds in the watershed. The OCs TMDLs Implementation Plan (see Section 8 of the November 16, 2006, staff report and subsequent revisions of the proposed Implementation Plan) also relies heavily on iterative BMP implementation to meet these reductions and allows for the revision of the current loads as new data become available.

**Comment #2**

A recent detailed review of the screening value by Dr. James Byard indicates several problems with the SA RWQCB's use of the New York Toxaphene value (see report appendix for detailed results of Dr. Byard's review). First, the screening value was derived using equilibrium partitioning methodology. According to this methodology, the concentration of biologically available contaminant is calculated based on a water concentration and the degree to which the contaminant tends to sorb to organic matter in sediment. This latter characteristic is accounted for by using an equilibrium partition coefficient,  $K_{ow}$ . However, although this methodology has been endorsed by the U.S. EPA Science Advisory Board and has been proposed by stakeholders in the Newport Bay watershed, the Regional Board has explicitly rejected its use in developing numeric targets for sediment in the proposed organochlorine TMDLs since the Regional Board views the method as involving too many assumptions and too much uncertainty (SARWQCB, 2006, p.34). Given this rejection of the methodology on which the screening value is based, it is unclear why the Regional Board is willing to adopt the screening value for the purposes of the toxaphene TMDL.

**Response #2**

Due to the complex composition of toxaphene (it is mixture of about 670 different chlorinated compounds), effects-based guidelines for toxaphene are not currently available; therefore, the lowest value derived using the equilibrium partitioning method was selected – in this case, the State of New York's equilibrium partitioning-derived target for toxaphene was selected as a conservative sediment quality guideline. The proposed OCs TMDLs implementation plan includes a task to review/revise the current targets and to develop targets specific to the watershed using site-specific data where possible.

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #3**

Dr. Byard found that the  $K_{ow}$  value used by the New York State Department of Environmental Conservation in deriving the screening value was outdated and 158 times lower than the  $K_{ow}$  published by both the U.S. EPA in their 2002 organochlorine TMDL for the Newport Bay watershed, and the Regional Board in their recently published draft organochlorine TMDL report. Thus, the New York value is incorrect and artificially low. Dr. Byard found that using a more appropriate  $K_{ow}$  in the New York State methodology yielded a sediment screening value of 15.8 ppb. This updated screening value corresponds to a toxaphene loading capacity in the San Diego Creek watershed that exceeds current loads, indicating that the watershed currently has excess capacity for toxaphene discharge. Thus, if the correct methodology is applied in determining the sediment screening value, there is no need for a toxaphene TMDL in the watershed.

**Response #3**

Dr. Byard's calculated target of 15.8 ppb for toxaphene is based on the State of New York human health water quality criterion of 0.005 ppb. Dr. Byard uses EPA's recommended partitioning coefficient for the Newport Bay watershed ( $\log K_{ow} = 5.5$ ) combined with the NY human health water quality criterion (0.005 ppb) to derive his preferred target. If a toxaphene numeric target is calculated for Newport Bay using the equilibrium partitioning method it should be based on the appropriate CTR ambient water quality chronic criteria (0.0002 ppb for protection of aquatic life and 0.00073 ppb for protection of human health), not NY's human health water quality criterion. Using EPA's partitioning coefficient for the watershed ( $\log K_{ow} = 5.5$ ) and the CTR chronic criteria, the calculated numeric target would be 0.6 ppb for protection of aquatic life and 2.3 ppb for protection of human health. Both of these equilibrium partitioning method-calculated targets are much lower than Dr. Byard's recommended 15.8 ppb toxaphene target, and the CTR aquatic-life criteria target of 0.6 ppb is similar in magnitude to the proposed TMDL target for toxaphene of 0.1 ppb.

**Comment #4**

In the draft organochlorine TMDL report, the Regional Board presents the guidance tissue level for toxaphene in California sport fish published by the Office of Environmental Health Hazard Assessment (OEHHA) as the governing standard for fish tissue concentrations in the watershed. The OEHHA value for toxaphene is currently 30 ppb. However, OEHHA is in the process of revising this value. The OEHHA draft report entitled "Development of Guidance Tissue Levels and Screening Values for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene" (February 2006) lists a revised guidance level of 220 ppb for toxaphene. This revised value of 220 ppb represents OEHHA's most up-to-date assessment of human health hazards related to fish tissue consumption. If an OEHHA value is to be used to regulate fish tissue concentrations in the watershed, 220 ppb should be used, not 30 ppb as the draft organochlorine TMDL proposes.

**Response #4**

The 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft screening values because there is no

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

guarantee that draft screening values will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

**Comment #5**

OEHHA screening values were never intended to regulate fish tissue concentrations. Rather, as noted in OEHHA (2006), “Screening values are specific guidance tissue levels used to identify situations where contaminant concentrations in fish are of potential health concern and further action (e.g., additional sampling or developing consumption advice) is recommended” (p. 43).

**Response #5**

The State Listing Policy requires the use of guidelines such as those presented in the OEHHA report. The OEHHA screening values satisfy the evaluation criteria selection requirements identified in Section 6.1.3 of the State Listing Policy. Targets are goals, not water quality standards; as such, the OEHHA screening values are considered appropriate for designation as numeric targets for protection of human consumers of fish.

**Comment #6**

Since June 1998 all red shiner concentrations sampled in the watershed have been below 220 ppb (see next section). In the record of data for species other than red shiner (dating to 1985), no tissue sample has ever exceeded 220 ppb. If it is further considered that red shiner are not generally consumed by humans—they are generally a bait fish—this means that data for typically-consumed fish species have never exceeded the revised OEHHA value during the period of record in the Newport Bay watershed. This suggests that a TMDL is not necessary for the purposes of reducing toxaphene concentrations in fish species inhabiting the Newport Bay watershed.

**Response #6**

See Response #5. Fish tissue concentrations cannot be compared to the draft OEHHA screening values until those values have been determined to be final and published as such. Additionally, staff did not compare red shiner tissue data to the 1999 OEHHA human health screening values as those values can only be compared to muscle fillets from finfish (fish that humans are likely to consume).

**Comment #7**

In the case of the red shiner, toxaphene tissue concentration data dating from 1983 show a substantial decline. Red shiner tissue concentrations may be taken as an indicator of toxaphene concentrations in the watershed, as red shiners are local, short-lived species. Two considerations suggest the robustness of the downward trend in red shiner tissue toxaphene concentrations. First, when all red shiner data are considered together, a statistically strong downward trend in toxaphene concentration is evident. Second, the statistical analysis that characterizes these trends has been confirmed by splitting the data set for red shiners into two separate sets consisting of the first ten years of data (1983-1992) and the second ten years of data (1993-2001). The decay rate obtained for the full red shiner dataset (1983-2001) is equivalent to a half-life of 3.4 years for toxaphene in the watershed.



***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #7**

Trends alone may not be used to delist or negate the need for TMDLs. Regional Board staff evaluated trends, recognized that they are significant and declining, and recommended that monitoring of natural attenuation be continued. The collection of trend monitoring data (through the State Mussel Watch and Toxic Substances Monitoring programs – SMW and TSMP) for the watershed was discontinued by the State in 2001. Beginning in 2006, funding was obtained by Regional Board staff to reinstate trend monitoring in the watershed for at least 3 years. This information will provide data that can be used to determine if the declining trends in the organochlorine compounds are continuing and whether or not concentrations in these media have declined sufficiently to warrant pursuit of delisting for these contaminants.

**Comment #8**

Mussel tissue data from Newport Bay for the period 1980 through 2000 do not show any statistically significant trends in wet weight toxaphene concentrations over time. However, toxaphene concentrations in 84 out of the 111 samples (76%) collected over the 21-year period were below analytical detection limits. In other words, the vast majority of samples collected were below the detection limit for toxaphene. Moreover, the frequency of non-detect results was consistent over time.

**Response #8**

See Response #7.

**Comment #9**

Watershed sediment data are available beginning in 1990 and also demonstrate a clear decline in toxaphene concentrations (see Figure 4). To evaluate the robustness of the downward trend, the data set for watershed sediment was divided into four geographically distinct sets representing Lower Newport Bay, Upper Newport Bay, San Diego Creek, and Peters Canyon Wash. This analysis showed that the calculated decay rates for the sediment data regressions at the four locations were similar within a 95% confidence range, suggesting that the downward trend in concentrations is statistically significant. The downward trend in concentrations is particularly strong for Lower Newport Bay sediment. Sediment samples collected from Upper Newport Bay, the Rhine Channel, San Diego Creek, and Peters Canyon Channel also demonstrate downward trends in toxaphene concentrations over time, though these trends are less robust than those for Red Shiner and Lower Newport Bay sediment.

**Response #9**

See Response #7. The trend monitoring reinstated by Regional Board staff includes the collection of sediment samples. It is also important to note that toxaphene impairment was identified only for San Diego Creek and the finding of impairment was based on fish tissue concentrations, not sediment.

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #10**

Despite evidence of downward trends in sediment toxaphene concentrations in the watershed, several factors complicate assessment of the sediment data. First, sampling was conducted by multiple agencies, using multiple methodologies, at varying locations and sample depths. Second, there is significant movement of sediment into, out of, and within the Bay and its watershed such that even samples taken in the same location at two different times may not represent the change in chlordane concentration for a specific quantity of sediment. Third, sediment concentrations in Newport Bay may be more indicative of toxaphene loads from years or decades past, since Bay sediments are transported from the upper watershed in a highly variable, episodic manner, correlated with storm events and wetter-than-average rainfall years. For all these reasons, the trends evident in the available sediment data for Newport Bay should not be weighted too heavily in overall assessment of toxaphene concentrations in the watershed.

**Response #10**

The finding of impairment for toxaphene was based on its presence in fish tissue not sediment. Thirty percent of the fish sampled in San Diego Creek Reach 1 and Peters Canyon Wash between 1995 and 2002 were found to exceed the NAS freshwater guideline for protection of aquatic life for toxaphene of 100 ppb. The State Listing Policy does not allow the use of trends or sediment chemistry alone to indicate impairment.

**Comment #11**

Only 10 toxaphene water concentration data points were available for the Newport Bay watershed. All data were collected in 2002, and none of the data points were above detection limits, which were of 10 ng/l. The CTR human health regulatory threshold for toxaphene in water is 0.000737 µg/L, or 0.73 ng/L.

**Response #11**

Toxaphene, like other organochlorine pesticides, is highly hydrophobic. Therefore, it is not surprising that toxaphene concentrations were not detected in the water samples. These data do not suffice to demonstrate a lack of impairment.

**Comment #12**

For toxaphene there were fewer agricultural soil data available than for DDT. Samples from different years were taken in different locations since the purpose of sampling was generally to assess site conditions for planning and development purposes, not to establish concentration trends over time in the watershed. The majority of toxaphene soil samples returned concentrations below detection limits. For example, for 2004 data, 222 of 230 six-inch depth soil samples, and 44 of 45 soil samples at depths greater than 24 inches, were below the analytical detection limit of 0.1 ppm. Although no statistically clear trends in soil toxaphene concentrations can be demonstrated from a dataset where about 96% of samples have toxaphene concentrations below detection limits, it is clear from these data that the mass of toxaphene in the watershed is currently quite small. This is consistent with expectations based upon the half-life of toxaphene.

***Attachment C1C – Response to Flow Science, Inc. Report on Toxaphene  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #12**

The analytical testing limit of 100 ppb used to measure toxaphene concentrations in the agricultural soils is well above the TMDL sediment numeric target of 0.1 ppb and is more than 6 times higher than Dr. Byard's proposed target of 15.8 ppb. The statement that the mass of toxaphene in the watershed is quite small due to the high number of non-detects is a reflection of the very high detection limit used and not an accurate indication of the mass of toxaphene that remains in the soils in the watershed. The remaining agricultural soils should be tested, using analytical methods with detection limits that are below the TMDL sediment numeric target for toxaphene of 0.1 ppb, to determine whether and to what extent these soils may threaten water quality. While the current detection limit used by most analytical laboratories for toxaphene analysis is higher than the proposed TMDL numeric target (10 ppb verses 0.1 ppb), past experience (e.g., selenium concentrations in water) indicate that analytical laboratories are often able to obtain lower their detection limits at a reasonable cost when necessary.

**Comment #13**

The observed decline in toxaphene concentrations in fish tissue and the low observed toxaphene concentrations in watershed soils and sediments are partly attributable to the natural removal of toxaphene from the watershed. The half-life of toxaphene in soil is reported as ranging from 1-14 years (U.S. EPA, 1999). The wide range is attributable to apparently differing degradation rates for toxaphene under aerobic and anaerobic conditions (U.S. Dept. Health and Human Services, 1996). Under anaerobic conditions the half-life of toxaphene in soil and sediment has been reported as on the order of weeks to months by the U.S. EPA (1979). However, under aerobic soil conditions, Nash and Woolson (1967) reported a half-life of 11 years. Assuming aerobic conditions are most common in the Newport Bay watershed suggests a half-life on the order of 11 years; given that the use of toxaphene was banned in 1990 and excluding other loss mechanisms, the mass of toxaphene in the agricultural soils of the Newport Bay watershed would have declined by at least 63% over the past 16 years due solely to natural removal. Assuming anaerobic conditions—conditions typical of sediments submerged in water, such as bay sediments—the half-life of toxaphene is on the order of weeks or months. This suggests sediments which remain consistently submerged in the watershed should currently contain very little toxaphene. The half-life for toxaphene in the watershed that was estimated using red shiner fish tissue data (3.4 years) is consistent with these estimates for the half-life of toxaphene in watershed soils.

**Response #13**

See Responses #7 and 12. The statement that sediments that remain constantly submerged should contain little toxaphene is not supported by the presence of toxaphene in red shiner tissue samples. The presence of toxaphene in red shiner tissue indicates that there is sufficient toxaphene in these sediments for it to accumulate in the fish's food web.

**Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Commenter/Agency*	Page Numbers	Comment Numbers
Craig J. Wilson, Division of Water Quality, State Water Resources Control Board	2	1-3
Dr. Cindy Lin, US Environmental Protection Agency Region 9	3-5	4-11
Larry McKenney, Director Watershed and Coastal Resources Division, County of Orange	5-10	12-21
Susan Paulsen, Flow Science Inc., Consultant to The Irvine Company	10-11	22
Dr. James Byard, Toxicologist Consultant to The Irvine Company	11-20	23-35
Dr. Ronald Tjeerdema, UC Davis Consultant to The Irvine Company	20-26	36-49
Dr. John Kabashima UC Riverside Agriculture and Natural Resources Cooperative Extension	26-28	50-55
John Withers, Acting Board Chair Santa Ana Regional Water Quality Control Board	28-29	56-58
Maurice Gallarda, Board Member Santa Ana Regional Water Quality Control Board	29	59

Note: Transcripts were prepared by Peters Shorthand Reporting Corp. Comments are summarized from transcripts and are not verbatim; repetitive words have been eliminated, spelling corrected, phrasing edited and/or condensed for clarity, and explanations added where necessary using brackets [ ]. For each comment, transcript page numbers are given in parenthesis (e.g., Comment #1 (T107)). A copy of the transcript can be found in Attachment H.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

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***Craig J. Wilson, SWRCB***

Comment #1 (T107)

Dr. Rose and I are in 100 percent agreement on the interpretation of these data and information. There's no disagreement on the need to place these waters on the 303(d) list. We recommended an additional two listings because the listing policy requires that all data and information be considered no matter how old.

Response #1

Comment noted. Regional Board staff used only data from 1994 to the present in their impairment assessment in order to reflect environmentally relevant conditions.

Comment #2 (T107)

I'd like to augment some things that Dr. Rose said. The approach that she described on interpreting narrative objectives using these guidelines is required by the listing policy [Water Quality Policy for Developing California's Clean Water Act Section 303(d) List]. It's a way to remove some of that subjectivity that we've all used in the past. Reasonable people often disagree on approaches. This listing policy provides us a specific way so we can come to an agreement and reproduce the work and clearly we have reproduced the same result.

Response #2

Comment noted.

Comment #3 (T108)

The draft listing policy was peer reviewed by University of California scientists, who did not comment adversely on the use of the National Academy of Sciences guidelines. These are the best now available to us, but scientific commentary about them is encouraging and healthy since it is part of the scientific process. The adaptive approach your staff are using so that impairment listings can be reassessed is appropriate.

Response #3

Comment noted. The NAS guidelines were ultimately used as thresholds because, in addition to the fact that they have been deemed by the SWRCB to be an appropriate translator for narrative water quality objectives, they also link pollutant concentrations in tissues to both the protection of aquatic life and predator organisms, and they have been scientifically-based and peer reviewed. Therefore, unless and until the current NAS guidelines are updated, site-specific targets, or more appropriate alternative, scientifically-based and peer reviewed guidelines are developed, the NAS guidelines are considered by staff to be the most defensible for evaluating direct adverse effects to aquatic life, as well as indirect effects to predator organisms through food web biomagnification.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

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***Cindy Lin, USEPA Region 9***

Comment #4 (T111-112)

EPA has reviewed the current contents of the OC's TMDL for San Diego Creek and Newport Bay, and a draft Basin Plan Amendment, and we will be able to approve it. EPA encourages Regional Board Members to support staff development and adopt these TMDLs in coming months. Once these TMDLs are finalized by State procedures and EPA approves them, then these TMDLs will supersede the EPA June 2002 TMDLs for corresponding waterbody pollutant combinations.

Response #4

Comment noted.

Comment #5 (T112)

EPA recognizes [that] Regional Board [staff] has modified previous EPA established TMDLs [Total Maximum Daily Loads for Toxic Pollutants, San Diego Creek and Newport Bay, California, USEPA Region 9, June 14, 2002], using technical approach and integrating loads from the sediment TMDL. EPA supports this technical approach as well as all of the components of the sediment TMDL. EPA supports the proposed numeric targets to address bioaccumulation as well as the allocations that are expressed appropriately in the TMDL.

Response #5

Comment noted.

Comment #6 (T113)

The targets proposed to address bioaccumulation in these TMDLs have been used around the State, as well as around the nation. EPA used these same targets in 2002 when we established TMDLs to meet our consent decree. Your staff have utilized the same values. They are appropriate numeric values and they should achieve the TMDL goals.

Response #6

Comment noted.

Comment #7 (T113-114)

EPA acknowledges that Regional Water Quality Control Board Staff have included assessment and supporting information to propose the delisting of certain water body pollutant segments. EPA generally concurs with these delisting decisions, although we have yet to make a final determination which we will anticipate in early 2007.

Thus, TMDLs may no longer be required for these segments. EPA will work with Regional Board and State Board Staff regarding the status of those TMDLs that EPA have established in 2002, yet, will not be replaced by those proposed and included in this package.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #7

Comment noted. Regional Board staff appreciates EPA's support of the OCs TMDLs and their willingness to assist Regional Board and State staff in resolving the status of EPA's technical TMDLs that will not be replaced by staff's proposed TMDLs.

Comment #8 (T114)

The fish tissue screening values from OEHHA are viable and common TMDL targets. And these are the ones that use current values used by OEHHA, and until those values are revised we will actually be using the current values. These numbers are also not dramatically different from EPA's numbers.

Response #8

Comment noted. The Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) does not allow the use of draft guidelines. OEHHA staff has indicated that they do not recommend using the draft screening values because there is no guarantee that draft screening values will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

Comment #9 (T115)

If the Regional Water Quality Control Board does not adopt these TMDLs then EPA's established TMDLs adopted in June 2002 still exist and will be reincorporated into new permits that are coming up.

Response #9

Comment noted.

Comment #10 (T115)

EPA emphasizes our support for the Regional Board Staff Report and these developed TMDLs because an implementation plan is included. This implementation plan will require stakeholders to perform specific tasks that will both help to reduce loads, as well as require follow-up monitoring to show improvements in water quality.

The implementation plan is reasonable and carefully considers timing and cost prior to dramatic reductions. Hence, you have the Phased TMDLs. It will also yield desired information to facilitate future evaluations for revisions to these TMDLs. We encourage all stakeholders to embrace and move forward with the implementation measures and thereby demonstrate good stewardship of the watershed.

Response #10

Comment noted. Regional Board staff appreciates EPA staff's support for adoption of the OCs TMDLs.

Comment #11 (T116)

EPA acknowledges that other pollution control activities, if required, may alleviate waters from being included in the 303(d) list. EPA has established guidelines for a case by case evaluation of such alternative measures. However, the State must indicate that the pollution control activities are required and are already taking place, that the reductions and

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

loads are occurring and that parties are committing to follow-up monitoring of the reduction measures. All of this has to be happening right now, currently or potentially start happening in early 2007.

The best way to ensure that all of this happened is to adopt this TMDL and start the implementation plan activities then the sufficient information may be available for future 303(d) listing cycle, which is when EPA considers the viability of such alternative control measures.

Response # 11  
Comment noted.

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***Larry McKenney, County of Orange***

Comment #12 (T118)

I would note that although the EPA representative has noted that the only way that you can avoid having a TMDL, which we're not advocating actually, would be to be having a load reduction being implemented now, but your staff pointed out to you that if you adopt the implementation plan that they're suggesting it's not targeting near term load reductions in the next five years, so that's kind of interesting.

Response #12

The OCs TMDLs do not require compliance with the waste load and load allocations until 2015. That does not mean, however, that load reductions are not expected to occur until after that date. A list of TMDL implementation tasks and schedules is provided in Table NB-OCs-13 in Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3. Several tasks require implementation within 1-3 months after State approval of the TMDL Basin Plan Amendment (BPA).

Comment #13 (T118)

It is true that even though we're not targeting near term load reductions with the implementation plan that's been proposed there are activities in the implementation plan that would be significantly expensive to the MS four permittees, and I think more significant - more expensive than staff has estimated.

Response #13

The November 17, 2006 OCs TMDLs technical report includes a section (Section 9.0) on economic considerations. Other stakeholders in the watershed had also expressed concern regarding the costs of implementation of the OCs TMDLs. As a result, Regional Board staff requested additional input from the stakeholders on the economic implications of the OCs TMDLs at the December 1, 2006 Public Workshop. However, only the Orange County Resources and Development Management Department (RDMD) actually provided additional economic cost information (see RDMD comment letter dated January 12, 2007; Attachment G). This information was considered in revising the proposed Basin Plan amendment, including enhanced emphasis on developing a collaborative, flexible and



***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. Pursuant to Task 7, an Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The work plan approach will allow Regional Board staff and stakeholders to prioritize and evaluate the proposed implementation tasks so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned.

Comment #14 (T119-120)

Specifically, we're talking about toxicity, which is a very problematic water quality condition to address in a TMDL because there are numerous pollutants that cause toxicity, and in this case we're talking about specific pollutants and specific targeted loads, but when Dr. Lin mentioned achieving the TMDL goals and she said that implementation plan would achieve TMDL goals, I guess it depends on what your goal is.

If the TMDL implementation plan that has been proposed results in reducing toxaphene and DDT, that might achieve the TMDL goal, but from my perspective as the Water Quality Control Manager for the County if we spend a lot of money doing that and we haven't reduced toxicity in the Bay, because there are many other toxicants that are not DDT and toxaphene, then we haven't done our job. And it may be that some of those other contaminants are actually much more significant in terms of causing toxicity, and perhaps can be treated much better -- much more easily.

Response #14

The OCs TMDLs implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3.) includes a task to evaluate sediment toxicity in San Diego creek and its tributaries, and in Upper and Lower Newport Bay (section 8.3.9(1), page 96 in the technical report). Revisions to the OCs TMDLs Basin Plan Amendment (BPA) include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. Pursuant to Task 7, an Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The development and implementation of a comprehensive, watershed-wide work plan (implementation plan Task 7) if pursued by the stakeholders, will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned.

Comment #15 (T120)

I guess the last thing that I would say about the comments that have already been made by EPA and the State Board is you don't direct stakeholders to do anything. The implementation plan doesn't require stakeholders to do things. If you're requiring people to do things, they are regulated. They're not stakeholders. What we have is a group of

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

people who do see themselves as stakeholders in this watershed and who have worked proactively to try to address this issue in a way that makes the most sense. The stakeholders want to do the right job and to do it better.

Response #15

Many of the stakeholders are also part of the regulated community in the watershed. Implementation of these TMDLs will require revision to existing permits and may require the issuance of new permits or conditional waivers of waste discharge requirements. We appreciate the stakeholders' efforts to work proactively on contaminant issues in the watershed. Towards that end, we have placed more emphasis in the Basin Plan Amendment (BPA) on a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. The Work Plan should provide a vehicle that we can use to agree on how to prioritize and deal with the various contaminant issues in the watershed.

Comment #16 (T121)

With regard to the calculated load allocation and wasteload allocation number for toxaphene, we're very concerned that we end up by doing that calculation with a target that is well below any detection limits. Which means, we don't understand how we could ever show that we're complying with a target like that. That's a kind of problem that we think is a serious problem for us as a regulated entity that has to demonstrate compliance.

Response #16

Analytical laboratories are very responsive to the need to lower method detection limits when regulatory limits require detections of compounds at lower and lower concentrations (e.g., laboratories can now routinely detect selenium at concentrations lower than the CTR chronic freshwater criterion of 5 µg/L). EPA Method 8270 can be used for analysis of OC pollutants in sediment and fish tissue. However, one of the problems with EPA Method 8270 is that it is not a very sensitive method for toxaphene analysis (Rich Gossett, CRG Marine, electronic mail dated August 9, 2007; Attachment I). This is because toxaphene is a mixture of several hundred compounds and it tends to fragment during analysis so much of the signal can be lost. Another method currently being used to detect total toxaphene in sediment and fish tissue, which overcomes some of these limitations, is Negative Ion Chemical Ionization (NICI or NICI) gas chromatograph mass spectrometer (GCMS). The use of NICI is allowed as part of EPA method 8270 and can detect toxaphene at concentrations below the TMDL numeric target for sediment of 0.1 ppb (Rich Gossett, CRG Marine, e-mail dated August 9, 2007; Attachment I). The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis (e.g., \$200/sample for traditional Method 8270 analysis versus \$250/sample for the NICI analysis).

Comment #17 (T121-122)

We don't think the implementation plan clearly enough describes who would be responsible for the tasks. These are summarized in Table 8.1 and it's particularly disturbing, I think, to see just as an example that there is a requirement in that table for the evaluation of runoff that would be coming from open space areas, not urbanized areas. And the implication is

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

that that would be an evaluation that would be a requirement on the MS4 [municipal separate storm sewer systems] permittees.

It doesn't seem appropriate for the MS4 permittees to be required to evaluate runoff from open space, but what's more important is that we don't really think that it's appropriate to require anybody to evaluate that. We don't think that there's a likelihood that there would be organochlorine contamination coming out of the National Forest, it doesn't seem to be a high priority issue.

**Response #17**

The parties responsible for implementation of each of the tasks are identified in the discussion of each of the tasks in the recommended implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3).

If the development and implementation of a comprehensive work plan is pursued by the stakeholders (Task 7 of the recommended implementation plan), one of the first tasks would be to establish an Independent Advisory Panel (IAP) and to develop a recommended plan that will address toxicity issues in the Newport Bay watershed in a coordinated and prioritized manner. The stakeholders who participate in this effort (Working Group) will be required to evaluate, with input from the IAP, the other individual tasks identified in the recommended implementation plan, to prioritize them and to justify to the satisfaction of the Regional Board at a public meeting, any recommendations for excluding or modifying one or more of these tasks. At that time, if it is determined that open-space monitoring for organochlorine compounds is either not necessary or will be addressed through a separate study or program, the Working Group will have the option to eliminate that task from the work plan, or to make other suitable modifications, provided that adequate justification is provided to the Regional Board, which will approve the proposed work plan prior to implementation.

**Comment #18 (T122-123)**

This prioritization of what we think the real issues are is well reflected in the Regional monitoring plan that stakeholders came forward with when we knew that the Regional Board was going to have to develop a specific Implementation plan for the technical TMDL that had been developed by EPA. We came forward and said that we really want to develop a scientific basis for evaluating toxicity and we want to design a monitoring program that would do that.

We worked for two years with your staff to develop that, we've agreed to it, and it's being implemented. What the implementation plan now includes are additional studies, and additional monitoring to that RMP. And I think that some of the additions reflect a departure from the whole concept of the Regional Monitoring Program, which was to focus our efforts on evaluating what the real causes of toxicity were, and identifying what the easiest things to address were so that we could reduce toxicity the fastest and most cost effectively. The concern with the proposed implementation plan is that we're beginning to go a little bit down the rabbit hole of addressing pollutants that may not be the most significant causes of toxicity and are disappearing anyway. It's just a matter of what's the best thing to spend public money on.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #18

While staff acknowledge that the organochlorine pesticides and PCBs concentrations in the watershed are continuing to decline and are not significant causes of *acute* toxicity, these pollutants are still being measured at levels of concern in invertebrates, fish and bird eggs in the watershed. Acute toxicity in the watershed is not the only issue that impacts water quality; indirect effects such as bioaccumulation and biomagnification of pollutants in the food web can cause long-term chronic impacts to sensitive species that are not readily apparent, but that can have a significant effect on the stability and long-term viability of the species as these chemicals often result in impaired reproduction and reduced immune system health.

However, if the development and implementation of a comprehensive work plan is pursued (Task 7 of the recommended implementation plan), one of the first tasks would be to establish an Independent Advisory Panel (IAP) and to develop a recommended plan that will address toxicity issues in the Newport Bay watershed in a coordinated and prioritized manner. Implementation of a Work Plan approach will also allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered.

Comment #19 (T123)

A better approach would be to look at toxicity as a whole. We have stakeholder's support for doing that. We have a group of people that are coming together. We have the model of the Nitrogen Selenium Management Plan where we have a stakeholder group, a work group that developed a work plan, stepped up with the money to implement it. I think that that would be the best approach to use for toxicity here, and I think that the Regional Board Staff also agrees that that would be a valuable approach.

Response #19

The revised Basin Plan Amendment (BPA) provides the opportunity for development of a comprehensive work plan for the watershed that will address OC pollutants as well as other potential sources of toxicity in the watershed. The work plan approach, if pursued by the stakeholders, would include an early task to establish an Independent Advisory Panel (IAP) of objective, qualified scientists who will help to evaluate and address areas of remaining uncertainty in the OCs TMDLs—and in particular, the issue of suitable TMDL numeric targets—and provide guidance and recommendations on the prioritization and appropriateness of the TMDL implementation tasks.

Comment #20 (T123-124)

If you take the time to ask the staff to go back and address some of the concerns that are raised today it won't result in a material delay and action anyway because we're already going to pull together the work group that we want to have of stakeholders and begin to develop a work plan using the analogy of the Nitrogen Selenium Management Plan.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #20

Regional Board staff has responded to the concerns raised by the stakeholders (see Attachment C, Response to Comments). Where appropriate, staff considered comments provided by stakeholders and federal agencies and made modifications to the proposed Basin Plan amendment (see supplemental staff reports and strikeout/underline version of the BPA). The information provided by the commenters on the recommended TMDLs will be included in the administrative record for the TMDLs.

Comment #21 (T124-125)

I don't think that the question that is going to be raised by most of the other comments that are going to come from the stakeholders today is an uncertainty question. It's a policy question. It's a procedure question about what the Regional Board's obligation is in terms of considering information that is brought to you that tends to show, not that your staff made errors, but that some of the information your staff were using, that their work was based on, has flaws in it.

If that information is brought to you we believe that it needs to be considered. And I don't think that it can just be dismissed by saying, well, you know, the other work was peer reviewed or the EPA has used these numbers in other places. Some of the information that is going to be presented to you today is – has potentially very significant effects on where public money will go and trying to address toxicity in the Bay, and so they're important comments. And it's not about uncertainty, it's about erroneous information in the facts that the action is being based on.

Response #21

The Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by State Board and USEPA Region 9 staff. In contrast, the assertions made by some stakeholders that the proposed TMDL targets are erroneous and scientifically unjustified are not defensible and are based primarily on the opinion of one commenter, Dr. James Byard, and the Flow Science reports based on his commentaries (see Attachment C1), which have not been subject to peer review and scientific validation.

The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets and loads as new information becomes available. An Independent Advisory Panel (IAP) will be established during implementation of these TMDLs as part of a coordinated, comprehensive work plan approach (see Task 7 in the proposed implementation plan); one of the first tasks of the IAP is expected to be the re-evaluation of the TMDL numeric targets.

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***Susan Paulsen, Flow Science, Inc.***

Comment #22

Importantly and just to clarify on a comment that was made earlier, we are not taking a look at the Water Quality Standards themselves, we're taking a look at the fish tissue targets

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

that were used to assess impairment and the sediment targets that were used in the TMDL to derive the TMDL load allocations and loading capacities.

Response #22

Comment noted.

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***Dr. James Byard, Toxicologist***

Comment #23 (T128-129)

I want to talk generally about the proposed numeric targets and then give you a few specific examples of where I think the proposed numeric targets are in error. [Dr. Byard referred to a table from Regional Board staff's November 17, 2006 TMDL technical report that summarized numeric targets].

I'd just like to say a few words about the NAS [National Academy of Sciences] fish guidance to protect wildlife. I'm not going to give you an example here, but I just want to point out one thing that might help you understand why we have a problem with the science here. These numbers are twenty-fold different; one is for salt water and one is for fresh water. But the two panels of the NAS that derive these numbers considered the same data. To give you an example the osprey was the species used to derive the saltwater value of 50, but the osprey feeds on both saltwater fish and freshwater fish. So the osprey was considered also in the thousand part per billion value.

They're based on the same information, but they're twenty-fold different. Okay. We think the value should be the value that was used to derive the CTR in the water column, which is a 150, which is between the two. So we're saying that the thousand is too high, the 50 is too low, based on the science.

Response #23

Board staff recognizes the dated nature of the NAS guidelines and would welcome review of those guidelines using appropriate scientific methods, i.e., consultation with appropriate agencies and parties and independent peer review. The State Listing Policy supports the use of NAS guidelines; however, they were ultimately chosen as thresholds because they also link pollutant concentrations in tissues to both the protection of aquatic life and predator organisms, and they have been scientifically-based and peer reviewed.

As we do not have access to all of the data that the different NAS panels used, we cannot judge why different values for freshwater and marine aquatic life were obtained. The freshwater NAS guideline for DDT is applied to both aquatic plants and animals on an individual basis and is less specific in its intent than the marine guideline. The marine NAS guideline for DDT is specific to the piscivorous food web; the guidelines are based on composites of fish in the size range consumed by the birds or mammals of concern. Given the fact that many species of birds, including the endangered California Least Tern, forage in freshwater, estuarine and marine environments, the more conservative of the two NAS guidelines would have to be met at all these locations to ensure protection of those species.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

In addition, even if the data presented by Dr. Byard supported a change in the recommended protective fish tissue levels for osprey, it would still need to be determined that the higher level of 150 ppb recommended by Dr. Byard would be protective for all or at least most species, since the original recommendation used the osprey as a surrogate for all fish eating species. However, exposure factors based on the osprey may not be protective of smaller more exposed species (e.g., California Least Tern) in the same feeding guild (smaller birds, such as terns, consume more fish per body mass than larger birds such as osprey), so review and revision of the data might actually result in lower levels than the current NAS guidelines. This type of review and determination is best done by a panel of experts followed by extensive peer review (Dr. D.A. MacDonald, NOAA, letter dated March 6, 2007; Attachment E).

Comment #24 (T129)

The State Policy [State Listing Policy], and maybe Craig Wilson [SWRCB] can correct me, it lists the thousand [NAS fresh water aquatic life criteria in ppb] it doesn't list the 50 [NAS marine (salt water) aquatic life criteria in ppb].

Response #24

The NAS marine guideline was unintentionally left out of Table 3, "Wildlife Protection Criteria for Evaluation of Bioaccumulation Monitoring Data", in the Functional Equivalent Document (FED) for the State Listing Policy. While the State Listing Policy does not specifically list the NAS marine guideline in its criteria table, it endorses the NAS aquatic life criteria as a whole (see Section 6.1.3 in the Listing Policy). Since the NAS marine guideline is for protection of aquatic life and is published in the NAS 1972 Water Quality Criteria document, it is suitable for use in impairment assessments or as a TMDL numeric target.

Comment #25 (T129-130)

The sediment numbers, all but toxaphene, were derived by one author and his colleagues, Donald MacDonald up in British Columbia and I've been interacting with Donald MacDonald, he's provided all his data sets. He's helped me get all the reports and underlying studies, and I've studied and analyzed these.

I'm going to give you a couple of examples to illustrate the problems. I found over 70 errors. Some of them were greater than 30,000-fold. These data points are useless for any purpose. They don't have any meaning in terms of science. That's the conclusion I came to.

Response #25

The "errors" supposedly identified by Dr. Byard are not put into context; he does not compare the numbers of supposed errors or flaws to the scale of the underlying data—are there 70 supposed errors in the dataset out of thousands of data points? (Dr. Byard lists 7 errors in Table 16 of the US Department of the Interior (DOI) report; these 7 errors are out of a total of 120 data points from 44 different references). Regional Board staff contacted Dr. Donald D. MacDonald, the same Donald MacDonald that Dr. Byard is referring to in his comment above, and asked him to respond to Dr. Byard's assertions.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Dr. MacDonald is one of the scientists involved in the development of the sediment quality guidelines (SQGs) relied on by Board staff in formulating the TMDLs. Both Regional Board staff and EPA staff selected Threshold Effects Levels (TELs) as appropriate sediment numeric targets for the OCs TMDLs since these SQGs represent the concentration below which adverse effects to benthic organisms are expected to occur only rarely. Dr. MacDonald responded to Regional Board staff's request and provided a letter that responds directly to Dr. Byard's assertions that the data used to develop the OCs TMDLs sediment numeric targets are flawed (MacDonald Environmental Sciences Ltd. (MESL), letter dated February 19, 2007; Attachment E).

In his response, Dr. MacDonald indicates that the "errors" asserted by Dr. Byard are not really errors in the underlying data or in the database but rather appear to reflect differences in the interpretation of the underlying data, differences in the analysis of those data, or differences in the selection of the level of protection that ought to be provided to humans and wildlife (i.e., the selection of numeric targets at which no observable adverse effects are expected vs. numeric targets at the threshold of observable impacts). Dr. MacDonald provides a detailed critique of Dr. Byard's conclusions and points out that the methods that were used to derive the sediment numeric targets (TELs and the data they are based on) were developed in conjunction with the Science Advisory Group on Sediment Quality Assessment and have been extensively peer-reviewed. The SQGs and the methods by which they were derived have been extensively published in the scientific literature. The TELs relied upon by Board staff in the proposed TMDLs have been used by various federal and state agencies to support sediment quality assessments and have been used as TMDL sediment numeric targets in the Los Angeles RWQB's Calleguas Creek Watershed OC Pesticides and PCBs TMDLs (LWA 2005).

Comment #26 (T130)

The OEHHA numbers [human health fish tissue screening values used as numeric targets in the OCs TMDLs technical staff report] are internal numbers in the OEHHA report [Pollock et al., 1991]. They were not intended by OEHHA to be used outside of OEHHA scientists. It's written – the disclaimer is in the report.

Response #26

Regional Board staff has reviewed the OEHHA report Dr. Byard refers to and cannot find a disclaimer that matches that as stated above by Dr. Byard. The 1991 OEHHA report (Pollock et al., 1991) uses "trigger levels"; these trigger levels are not the same as the OEHHA screening values (SVs) (Pollock and Brodberg, 1999) used as fish tissue numeric targets for the protection of human health in the November 17, 2006 OCs TMDLs technical report and proposed TMDLs.

The OEHHA human health SVs were used by Regional Board staff to assess whether the narrative water quality objective for protection of human health is being achieved in the watershed. OC pollutant concentrations in fish fillets collected from the watershed were compared to the OEHHA human health risk SVs (Pollock and Brodberg, 1999) in the OCs TMDLs impairment assessment. The screening value approach identifies chemical contaminants in fish that occur at concentrations that may be of concern to human health



***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

for frequent consumers of sport fish. These values are not meant to be regulatory criteria, but instead are used to reveal where the need exists for further investigation. Consistent with the State Listing Policy, exceedances of OEHHA SVs are being used by Regional Board staff (and others) as thresholds to indicate that contaminants have bioaccumulated in fish tissue to levels that may be of concern to human health and that threaten to violate the Basin Plan narrative water quality objective for toxic substances (*"Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health"*). The use of the OEHHA screening values for interpreting narrative water quality objectives is allowed by section 6.1.3(2) of the State Listing Policy. Regional Board staff also elected to use the OEHHA SVs as fish tissue targets for the protection of human health as there are no regulatory numeric criteria for fish tissue.

Comment #27 (130-131)

They [OEHHA] did a study in 1987 in Southern California where they sampled widely the fish, including Newport Bay. They're primarily concerned about the Palos Verdes shelf contamination, which is very, very high. But they looked at the whole southern California area. And they issued the report in '91, it's hard to get that report, I had to work hard to get it. Fortunately, I knew the author and he hand-copied it. But anyway you read that report and by site they were trying to come up -- if it were just DDT -- by site the number would be a thousand not a hundred.

They were trying to achieve a risk of one and ten thousand by site. The one -- the 100 number up here for DDT -- this number is a one in a 100,000 risk. I think you saw that in Kathy Rose's information as well. So they never listed Newport Bay because it didn't meet their criteria. Okay. There's no [fish] advisory for Newport Bay. And that's true of these other numbers as well.

Response #27

The 1987 OEHHA study (Pollock et al., 1991) did not sample fish in Newport Bay. They sampled fish at Newport Pier, outside of the Bay. The 24 sites sampled in Southern California were selected to represent areas fished by pier, private boat and party boat anglers; no estuarine locations were sampled. The trigger levels for DDTs and chlordanes were based on excess cancer risks of 1 in 100,000 ( $1 \times 10^{-5}$ ), not 1 in 10,000 ( $1 \times 10^{-4}$ ). For PCBs however, an excess of cancer risk of 1 in 10,000 was used as the method detection limit used for the chemical analysis was too high to be able to use the more conservative 1 in 100,000 excess cancer risk.

Comment #28 (T131)

And now we have the new statement. It's a draft policy by OEHHA and the number is 560 [ppb] for DDT, which is, I think everyone would agree that number is met. It's still in draft form, okay. But the science is there. It considers non-cancer endpoints, which this number does not. It considers the decay of the DDT in the environment.

So, you know, we can use this science, the science has already been there. It's just not been used. So we can use this science and use the 560 number or we can use this old

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

number inappropriately, as it's been done and use the 100. When really a 1,000 was used in the original assessment in Newport Bay.

Response #28

The State Listing Policy precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft SVs for DDT (560 ppb) because there is no guarantee that draft SVs will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

Comment #29 (T131-132)

I'm going to start with the sediment targets and give you an example. And they're flawed, there's missing data, there's double counted data points, selective inclusion of data points, some very important data points are left out from the same reports, misinterpretation of underlying data.

Response #29

See Response #25.

Comment #30 (T132-133)

I want to talk about the toxaphene sediment targets. The target is the tenth of a part per billion. This is so low we can't even measure it with the current standard approved methods. It's derived from New York State Guidance; it uses a method called equilibrium partitioning, which just basically looks at the distribution of toxaphene between sediment and water. And they use an outdated or incorrect partition coefficient. There's not even a reference for it so I don't know where they got it. But if I use the partition coefficient that's in the staff's report [November 16, 2006 TMDLs technical staff report] also in the EPA 2002 report [EPA's technical TMDLs for Toxic Pollutants, San Diego Creek/Newport Bay, California, promulgated June 14, 2002], and a number that I think is more correct, the target would be 15.8 parts per billion. It would be a 158 fold higher.

So if we just make the simple correction in using the partition coefficient that's in the staff report that you have before you. The number goes from a tenth to 15.8. And the consequences in using a tenth are the annual allowable discharge from the watershed would be 5.67 grams per year. That was also in Dr. Rose's presentation. And their estimate of existing discharge is 42.8 grams. We would have to reduce the sediment load in the watershed, since the toxaphenes are found in the sediment, by 87 percent...there would have to be an 87 percent reduction in the sediment load with a tenth of a part per billion sediment target. If we corrected this by this 158-fold factor the low would be 896 [grams]. This would be 20 times the existing load.

Response #30

Analytical laboratories are very responsive to the need to lower method detection limits when regulatory limits require detections of compounds at lower and lower concentrations (e.g., laboratories can now routinely detect selenium at concentrations lower than the CTR chronic freshwater criterion of 5 µg/L). Toxaphene can now be detected at concentrations below the TMDL numeric target for sediment of 0.1 ppb using Negative Ion Chemical Ionization (NICI or NICI) gas chromatograph mass spectrometer (GCMS) (Rich Gossett,

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

CRG Marine, e-mail dated August 9, 2007; Attachment I). The use of NICI is allowed as part of EPA method 8270. The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis (e.g., \$200/sample for traditional Method 8270 analysis versus \$250/sample for the NICI analysis).

Dr. Byard's calculated target of 15.8 ppb for toxaphene is based on the State of New York human health water quality criterion of 0.005 ppb. Dr. Byard uses EPA's recommended partitioning coefficient for the Newport Bay watershed ( $\log K_{ow} = 5.5$ ) combined with the NY human health water quality criterion (0.005 ppb) to derive his preferred target. If a toxaphene numeric target is calculated for Newport Bay using the equilibrium partitioning method it should be based on the appropriate CTR ambient water quality chronic criteria (0.0002 ppb for protection of aquatic life and 0.00073 ppb for protection of human health), not NY's human health water quality criterion. Using EPA's partitioning coefficient for the watershed ( $\log K_{ow} = 5.5$ ) and the CTR chronic criteria, the calculated numeric target would be 0.6 ppb for protection of aquatic life and 2.3 ppb for protection of human health. Both of these equilibrium partitioning method-calculated targets are much lower than Dr. Byard's recommended 15.8 ppb toxaphene target, and the CTR aquatic-life criteria target of 0.6 ppb is similar in magnitude to the proposed TMDL target for toxaphene of 0.1 ppb.

Staff recognizes that accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging. Compliance with the Sediment TMDLs is expected to substantially help to reduce organochlorine compounds in the watershed. The OCs TMDLs Implementation Plan (see Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3) also relies heavily on iterative BMP implementation to meet these reductions and allows for the revision of the current loads as new data become available.

Comment #31

So these are the kind of errors we're talking about. These are not little errors. I don't think this is something where there's actually a difference of opinion on the science. I think we all agree. And maybe this [the numeric targets previously discussed] is peer reviewed, but it's just simple math.

Response #31

As pointed out in our earlier responses (see Responses #25–30) Regional Board staff do not agree with Dr. Byard's assertions that the TMDL numeric targets are full of errors. The Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by State Board and USEPA Region 9 staff. Dr. Byard's assertions, and the Flow Science reports based on his commentaries (see Attachment C1), have not been subject to peer review and scientific validation as required by the State Listing Policy.

The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets and loads as new information becomes available. An Independent Advisory Panel (IAP) will be established during implementation of these TMDLs as part of a coordinated, comprehensive work plan approach (see Task 7 in the proposed implementation plan); one of the first tasks of the IAP is expected to be the re-evaluation of the TMDL numeric targets.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #32 (T135)

My other example for the sediment targets was DDT. The TEL is 3.89, and this is developed again by Donald McDonald up in British Columbia and his colleagues he was very helpful in having me understand how this number was derived in all the reports and everything. This thing is so flawed and you have to read my report to get to understand that.

For example, on this particular number, 3.89, five data points were off by factor of 30,000 to give you some idea. So if you corrected all of these mistakes, this number instead of 3.89 would be ten to a hundred times higher.

Response #32

See Response #25 and Attachment C1A (Regional Board staff responses to Flow Science, Inc. DDT Report).

Comment #33 (T135-136)

Mr. McDonald was also asked to work on the Palos Verdes shelf problem in the State's litigation against the polluter of that area. And so he wrote up a report. And in his report he drew the conclusion – now, this is the same gentleman and his colleagues who generated this number, this TEL that's in the staff report – he concluded that the threshold for toxicity for DDT in sediments in Southern California was 7,120 parts per billion.

Above this level you would have toxicity, below it you would not. This is [toxicity] to the benthic organisms. So there's a huge difference, about 2,000 thousand fold, between these numbers. So this number is not only incorrect because of the errors in it it's just so over protective. What are you buying here? You don't need that big a margin of safety.

Response #33

Dr. Byard appears to be referring to the sediment effects thresholds (SECs) that were developed by Dr. MacDonald for the Southern California Bight. The TELs and SECs are intended to serve two very different purposes. The TELs define the concentrations of DDTs below which adverse effects on sediment-dwelling organisms are unlikely to be observed while, the SECs are intended to define the concentrations of DDTs above which adverse effects on sediment-dwelling organisms are likely to be frequently observed (MacDonald Environmental Sciences Ltd. (MESL), letter dated February 19, 2007; Attachment E). The SECs are intended to define toxicity thresholds of DDTs, while the TELs are intended to be conservative sediment quality objectives that are highly protective of the benthic community (MESL, letter dated February 19, 2007; Attachment E).

Comment #34 (T136-137)

There's never been an OEHHA advisory for Newport Bay in sport fish for organochlorines. If you take the data that staff's relying on to say that this hundred dollars parts per billion is being exceeded. If you average it, the average is actually 79 parts per billion. Okay. So sport fish people we're talking about a 70-year consumption. So the average is a more relevant number than the few exceedences.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Also, if you take out the migratory fish, there's almost no exceedences in the averages, much less than the 79. So as a scientist, the conclusion is there's no hazard and OEHHHA, who is the agency making this determination, has also concluded that.

Response #34

The 1987 OEHHHA study (Pollock et al., 1991) that Dr. Byard is referring to above, did not collect fish from Newport Bay. Fish were collected at Newport Pier, outside of the Bay. The 24 sites sampled in Southern California were selected to represent areas fished by pier, private boat and party boat anglers; no estuarine locations were sampled. OEHHHA has issued a sport fish consumption advisory at Newport Pier for California Corbina ([http://www.oehha.ca.gov/fish/so\\_cal/socalpddp.html](http://www.oehha.ca.gov/fish/so_cal/socalpddp.html)).

While findings of impairment are most conclusive when pollutant concentrations in *resident* fish species are evaluated (rather than concentrations in *transient* fish), the OCs TMDLs impairment assessment evaluated all fish tissue data. Impairment findings were supported whether or not the evaluation was restricted to resident fish species, or whether it considered both resident and transient species. There is a substantial amount of uncertainty when evaluating concentrations in fish whose home range includes areas outside of the Bay. Pollutant concentrations in transient species captured within embayments could reflect the pollutant concentrations of either in-bay or offshore waters, depending upon the amount of time spent in each area. With some fish species, however, it is not known with certainty whether they are resident or transient. Disregarding certain data because residency cannot be established with certainty could lead to erroneous conclusions. During implementation of these TMDLs, indirect effects due to bioaccumulation and biomagnification will be better evaluated, and the appropriate target species and protective tissue concentrations for those species will be identified.

Comment #35 (T137-138)

This will be my last example and it's on the chlordane TMDL and this is where the weight of evidence approach was used to say that chlordane was impairing the benthic organisms. They use a target like this called the ERM [Effects Range Median] in making this evaluation, the value of six.

And, again, I looked closely at that data point and it's so flawed. It's many times six. Okay. That's in the report -you'll see that. So that ERM is an inappropriate data point for evaluation. They attribute sediment toxicity to chlordane based on (inaudible) associations when there are hundreds of other chemicals in those sediments that could have caused that toxicity.

So what they didn't do is they didn't look at the literature, at least not in the staff report, to evaluate toxicity to the benthos and I found that if this is in the dungeness crab, which was the most sensitive species, and a chronic study considered all life stages [of the crab] so this is considered the most sensitive [organism] for assessing toxicity to benthos. And the threshold for toxicity was above -- it was somewhere between 243 and 2,430 parts per billion. 2,430 was an effect level and 243 was a no effect level. So how can we have toxicity in the Bay when the levels average around ten where the maximum [concentration measured in the bay] in the last ten years was 55 [parts per billion]?

**Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

So this was not part of the weight of evidence approach and it should have been and I think it would have negated the other information.

Response #35

An ERM (Effects Range Median) is the 50<sup>th</sup> percentile on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect (O'Conner, 2004). The purpose of an ERM is to infer associations between chemical contaminants and adverse biological effects, and as a framework for follow-up research and monitoring. The ERM is interpreted as the point above which adverse effects are expected.

Dr. Byard's assertions that the ERMs are flawed due to 'out-of-date' partitioning coefficients and 'inappropriate' data gathering techniques have not been substantiated by others. Dr. Byard's assertions and alternative sediment targets for chlordane have not been published and subject to rigorous scientific review through the peer review process. Reliance on such recommendations would be contrary to the requirements of the State Listing Policy (see Section 6.1.3 "Evaluation Guideline Selection Process" of the Policy). The chlordane ERM developed by Long and Morgan (1990) that was used in Board staff's impairment assessment, has been published and subjected to scientific peer review as required by the State Listing Policy. Additionally, one of the strengths of sediment quality guidelines such as ERMs and TELs, is that they are designed to determine the toxicity thresholds of these contaminants when they occurred in complex mixtures with other contaminants in sediments (MESL letter dated February 19, 2007; Attachment I).

Dr. Byard also refers in his comment to Dungeness crab (*Cancer magister*) data that he then uses to calculate alternative sediment targets. The Dungeness crab data are from Dr. Richard Eisler's 1990 report entitled "Chlordane Hazards to Fish, Wildlife, and Invertebrates: A Synoptic Review" (Eisler, 1990, USFWS Biological Report 85(1.21)/Contaminant Hazards Report 21) (see Dr. Byard's commentary in the appendix to the October 20, 2006 Flow Science Inc. report on Chlordane in the Newport Bay Watershed, Attachment D2 to the September 2007 supplemental staff report). The no observable effect level (NOEL) for Dungeness crab from Eisler (1990) is 0.015 ppb and the 50% Lethal Concentration (LC<sub>50</sub>) is 0.15 ppb in water. Dr. Byard apparently used these numbers to calculate his alternative sediment targets using the octanol water partitioning coefficient recommended by USEPA for chlordane ( $\log K_{oc} = 6.21$ ) (USEPA 2002) and the equilibrium partitioning method to come up with his calculated range of no effects levels in sediment of 243 ppb and effects at 2430 ppb.

Regional Board staff elected not to use the equilibrium partitioning method employed by Dr. Byard for several reasons, including the fact that (1) it assumes that equilibrium conditions are present, (2) it does not allow for bioaccumulation from ingestion of sediment or dietary intake, and (3) there is substantial uncertainty in the selection of partitioning coefficients and organic carbon (see Section 3.2.3 in the November 17, 2006 OCs TMDLs technical report). However, if staff were to calculate sediment targets using the equilibrium partitioning method, we would have to use the CTR chronic criteria with USEPA's partitioning coefficients. Sediment targets using the CTR chronic criteria and the equilibrium partitioning method calculate as follows:

**Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

47 ppb for protection of salt and fresh water aquatic life  
9.2 ppb for protection of human health

These numbers are much lower than Dr. Byard's lowest calculated sediment target based on the Dungeness crab of 243 ppb.

In his report on chlordane hazards (Eisler 1990), Dr. Eisler reviewed USEPA's proposed ambient water quality criteria for Chlordane (1990), which was adopted into the CTR. Dr. Eisler makes the following recommendations regarding the proposed criteria:

*"Safe" [chlordane] residues in tissues of aquatic biota require clarification, and probably additional research effort. Criteria on chlordane for protection of mammalian wildlife are missing, and those formulated for birds are incomplete and require data on no observable- effect levels from lifetime exposures. Until this information becomes available, it seems prudent to use criteria developed for human health protection as temporary guidelines for the protection of vertebrate wildlife."*

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**Dr. Ron Tjeerdema, UC Davis**

Comment #36 (T139)

What we've noticed with the trends in OCs in the Newport Bay region is that they're statistically significantly declining and the probability that [there is] no [declining] trend in light of all the data is vanishingly small.

In essence what we're saying is that Red Shiner, which is the resident species for which we have the best tissue data, certainly has a nice statistically significant trend. However, there are about ten other data sets that also have declining trends that when you take in combination, statistically speaking, for them to be sort of random that probability would be extremely small.

Response #36

Regional Board staff evaluated trends, recognized that they are significant and declining, and recommended that monitoring of natural attenuation be continued.

Comment #37 (T140)

One of the things that I find most interesting with the trends in this Region – and I'd like to show three examples here – is that you see dramatic changes in OC concentrations. Again, these are in Red Shiners, which are again the resident species of that area, over the past 25 years or so. And so, for instance, this is a case where you're seeing a change from about 1980 when data was first taken to around the early 2000's, 2002 and you'll notice that what we tend to see in the environment is a situation of what's called a first order of decay process. And this can be caused by number of different factors of DDT. It's caused by primarily volatilization or evaporation early on. Later on it's caused by microbial degradation. With other chemicals it would be caused by other things.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #37

The Qualitative Environmental Analysis, Inc. (QEA) memo dated October 3, 2006, which was provided to Flow Science, Inc. and included as Appendix A of their report on DDT (Flow Science, Inc., November 20, 2006; Attachment D1 to the September 2007 supplemental staff report), states that “the rate of decline of DDT in the Newport Bay system has slowed over time” with the rate of decline in DDT concentrations in sediment, fish tissue (Red Shiners) and mussels being greater during the earlier time period reviewed (early 1980s - 1990s). The State Listing Policy also recommends that a trend analysis consider the influence of seasonal effects, inter-annual effects, changes in monitoring methods, changes in analysis of samples, and any other factors deemed appropriate. It is not clear that these have been adequately or appropriately considered in the QEA/Flow Science analysis of contaminant trends in the watershed.

Regional Board staff evaluated OC contaminant trends in sediment, shellfish and fish tissue and recognized that they are significant and declining (Section 2.0 and Figures 2-1 through 2-5, November 17, 2006 OCs TMDLs technical report). Accordingly, Board staff recommended phased TMDLs to allow for refinement and revision over time. The proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process. The proposed implementation plan includes monitoring to evaluate the attenuation process and the efficacy of control actions in the watershed. While natural attenuation has occurred, concentrations of DDT in sediment, mussel and fish tissue data indicate that DDT continues to bioaccumulate in the biota in the watershed.

Comment #38 (T140)

When you look at a fish that's higher up in the food chain they tend to mimic or reflect what's happening to the sediments and so forth, water in the environment. And they can in some respects buffer changes – over time they leave you a nice trend.

Response #38

While a fish tissue trend analysis may indicate what is happening to contaminants in the fishes' environment, it does not tell you whether or not the fish, or higher trophic level predators, are being negatively impacted by the contaminants of concern. As stated previously in Response #37, the State Listing Policy recommends that a trend analysis consider the influence of seasonal effects, inter-annual effects, changes in monitoring methods, changes in analysis of samples, and any other factors deemed appropriate. Additionally, the State Listing Policy also specifies that trends alone may not be used to de-list or negate the need for TMDLs and data cannot be regressed out but must be based on actual samples.

Comment #39 (T140-141)

What's happening with DDT, for instance, over time is we're seeing a nice trend – a nice downward trend that regressed out is statistically significant and provides a half life, which is the amount of the time it takes half of what's in the environment to disappear, of about 3.8 years.



***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Now, that's quite a bit shorter than the roughly 20-year half life of dissipation for DDT in sediments from natural degradation processes. And so we're seeing a nice trend going on here, which if regressed out would continue to do so.

Response #39

See Responses #37 and 38.

Comment #40 (T141)

My understanding is that they're [RWQCB staff] currently using the 2002 numbers to reflect what's going on today in the bay or in the watershed. They [USEPA] were previously using the 1998 numbers, and I've strongly suggested that they [RWQCB staff] regress out and use the entire data set because that's where you get the most powerful use of that data. And because it is statistically significant it certainly represents a good sort of maximum value for that data set that you might look at.

Response #40

See Response #38.

Comment #41 (T141)

If you take the same data set for DDT, for instance, and QEA consultants regressed this for us out to 2015 [see Appendix A to Flow Science report, "DDT Analysis for the Newport Bay Watershed, dated November 20, 2006], shown at the very bottom here, 2016, the target for when the full implementation would occur. The regressed concentration in Red Shiners would actually be below the target way down already at about 14.7 or so parts per billion. And this is just letting the natural system continue to do its thing, which is essentially remediation.

Response #41

See Responses #37 and 38. The impairment assessment clearly indicates that DDT is continuing to bioaccumulate in organisms at concentrations that may result in direct or indirect adverse effects to the biota, and that reductions in DDT loads in the watershed are necessary in order to ensure the protection of all beneficial uses. While natural attenuation alone cannot be used to de-list or to preclude the establishment of TMDLs, the proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process.

Comment #42 (T142)

We have data, not only for Red Shiner, which are resident to the Bay. We also have it for mussels, which have been done for many years by Mussel Watch, which are put in the Bay and kept there, and so they're placed over the sediment basically.

We also have data for the sediment and with mussel data; we actually have fairly good mussel data for a number of years. Again, primarily produced by California Mussel Watch and this goes back from 1982 to 1999, and the mussel data shows a significant half life of about five years.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #42

Comment noted. See Responses #37 and 38.

Comment #43 (T142-143)

There's a problem with the sediment data, I don't have a graph of the sediment data, but it's sort of in two patches for the 20-year period with a gap in between. And the problem with the sediment data – and that's not only for DDT but it's also for toxaphene and chlordane, which I'll show you in a moment – is that the sediment data was from different agencies over a 20-year period of time, it was taken at different depths, at different locations, there was no uniformity in the sediment data and so we tend to see the least trend with sediment data than we do with organism data. But, again, as I mentioned before that the organism data tends to buffer out changes in sediment over time because sediments are going to be washing in and out of the watershed and so forth during the time period.

Response #43

See Response #38.

Comment #44 (T143-144)

Now, the second example –and I've only got three graphs so this won't take long – is with toxaphene, which similar to DDT, is a relatively water or very water insoluble compound, and we have again for Red Shiner, good information with toxaphene going over a span of about 20 or 20 or so years, roughly 20 years, and if you take and you statistically regress the toxaphene data over that entire period of time you get a half life in this case of about 3.4 years. And so very similar to what we see for DDT, and, again, much quicker than the half-life for natural soil attenuation going on.

Response #44

Regional Board staff evaluated OC contaminant trends in sediment, shellfish and fish tissue and recognized that they are significant and declining (Section 2.0 and Figures 2-1 through 2-5, November 17, 2006 OCs TMDLs technical report). Accordingly, Board staff recommended phased TMDLs to allow for refinement and revision over time. The proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process. The proposed implementation plan includes monitoring to evaluate the attenuation process and the efficacy of control actions in the watershed. While natural attenuation has occurred, the presence of toxaphene in fish tissue indicates that toxaphene is continuing to bioaccumulate in the biota in the watershed.

Comment #45 (T144)

My sort of main point here is, in working in this area for some 20 years, is that I'd really like to see all of this taken into consideration statistically because I'd like to see where we are today. And where we're going to be at full implementation because nature may be sending us there already.

Response #45

The State Listing Policy specifies that trends alone may not be used to de-list or negate the need for TMDLs and data cannot be regressed out but must be based on actual samples.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process. The proposed implementation plan includes monitoring to evaluate the attenuation process and the efficacy of control actions in the watershed.

Comment #46 (T144-145)

With toxaphene for mussels and with sediments there's a problem with no clear trend. The problem is that with most of the mussel watch data it's non-detect. It's already below analytical detection limits. In fact, of the 111 samples that we were able to acquire, in terms of data, 76 percent or 84 were non-detect, so there's no clear trend again with mussel data, but, again, with a consuming type of fish that is resident to that area –quite a nice statistically significant trend, which is certainly reflective of what's potentially going on with OCs there.

Response #46

The detection limit (100 ppb) of the analytical method used to measure toxaphene concentrations in the agricultural soils and in mussel tissue and sediment by the State Mussel Watch program is well above the TMDL sediment numeric target of 0.1 ppb. The high number of non-detects is a reflection of the very high detection limit used and is not an accurate indication of the mass of toxaphene that remains in the soils in the watershed. While the current detection limit used by most analytical laboratories for toxaphene analysis is still much higher than the proposed TMDL numeric target (10 ppb verses 0.1 ppb), new analytical methods allow much lower detections of toxaphene in soils and mussel/fish tissue. Negative Ion Chemical Ionization (NCI or NICI) gas chromatograph mass spectrometer (GCMS) is allowed as part of EPA method 8270. The NICI method can detect toxaphene at concentrations below the TMDL numeric target for sediment of 0.1 ppb (Rich Gossett, CRG Marine, e-mail dated August 9, 2007; Attachment I). The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis. Future sediment and tissue monitoring using these lower detection limits should help to determine whether or not the declines in toxaphene concentrations are continuing and are statistically significant.

Comment #47 (T145)

With chlordane, again, you're seeing this nicer regression for roughly the same period of time. The earlier 80's to the early 2000's, and, again, with chlordane this regression is highly significant and it has a half-life of about four years.

So we're working on a three to four year half-life for all three of OCs, which, again, is much faster than their natural attenuation in sediments would be. And again, because you've got an interaction of chemical between sediments, and water, and organisms, fish over long period of time will reflect what's going on in the environment in general because they're all in equilibrium.

Response #47

See Response #45.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #48 (T146-147)

Trends will continue in time. And that's what we're looking at. That's what we're considering is that the trends that have been going on for a long period of time, you've got this long period of temporal data tells us statistically that that trend will continue because you've got 20 years of data that's telling you that. And, in this case, when we look at the attenuation we can take a look at the compounds again – three OCs up here and then their dates they were banned – DDT has been banned for some 34 years, chlordane for almost 20, toxaphene for about 16, and their natural attenuation in the environment and soils can be different.

So, for instance, with DDT if you assume a half life of 20 years for DDT and soil, which is a very conservative half life because it's measured anywhere from two to 20 years, but if you assume a 20-year half life in soils then with that 34-year time period we're looking at, then you would estimate at least 60 percent would have degraded and dissipated by now.

Now, if the half- life is less than 20 years, which is a good possibility, then this percentage will go even higher. Again, what we're seeing in Red Shiner tissues is a half life number that's quite a bit lower than the 250 years. For chlordane having been banned in 1988 we're seeing, in this case, using the half-life for chlordane the most conservative half-life of about ten years, again for soil dissipation. We're seeing that in that time period you would have to estimate about 75 percent would be gone based upon that half-life. Again, in this case, we're seeing a half-life in Red Shiners that's substantially faster than ten years, which means that potentially this number could be substantially higher than 75 percent. Again, that's a conservative number.

And finally for toxaphene. Toxaphene was the last to be banned in 1990 here. And toxaphene has a half-life depending upon what report you look up of anywhere from one to 14 years. Again, natural degradation and soils. If you assume 14 years, a conservative value, then today you would predict that about 60 to 65 percent would be degraded. Again, that's with a 14-year half-life. In Red Shiner we're seeing a half-life substantially shorter than 14 years and so potentially what's happening in the environment there is that this 63 percent is probably quite a bit higher as well, in terms of the operational half-life going on at that time.

Response #48

See Response #45.

Comment #49 (T148-149)

The other thing that comes into play with chemicals or OCs in this watershed is a change in land use over time. And we've also got an issue, as I think everybody is aware, that conversional land use in the watershed is also going to be contributing to a further decline in whatever residues are left at this point.

We're not seeing a trend back toward agriculture, but obviously away from agriculture, and as this conversion continues further soil erosion transport will diminish. And so not only are we dealing with a natural degradation of these OCs in the environment, but also we're

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

dealing with a situation where there's less sediment that these things are being carried by reaching the watershed as well.

**Response #49**

The conversion of land use in the watershed is acknowledged in the OCs TMDLs (see Sections 4.2.2 and 8.3.2 in the November 17, 2006 technical staff report). Because much of the land that is currently being converted to urban uses was once agricultural lands that may contain soils that still have concentrations of organochlorine pesticides, monitoring of these pollutants during construction and post-construction activities is necessary to ensure that these contaminants are not being transported to surface waters by sediment erosion and runoff.

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***Dr. John Kabashima, UC Riverside Cooperative Extension***

**Comment #50 (T152-153)**

One of things that I'd like to re-emphasize for you is that agriculture and nursery production is diminishing dramatically. So those numbers from 2001 to 2006 actually represent about a 47 percent decrease in production and by 2010 when the leases are up most of it will be gone.

**Response #50**

The limited duration of the remaining agricultural operations in the watershed and the conversion of these lands to urban uses is acknowledged in the OCs TMDLs (see Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 2, and Section 4.2.2 in the November 17, 2006 TMDLs technical staff report).

**Comment #51 (T153)**

One of the problems in this watershed in terms of even preceding the TMDL discussions on sediments is that these are primarily operations on lease land, and primarily short-term leases. Strawberry growers here have crop-to-crop leases. So the implementation of best management practices [BMPs] on our part and our applied research has primarily been looked at in the parameters of what they can afford to do in the period of time that they might actually have a lease.

**Response #51**

This issue is also acknowledged and addressed in the November 17, 2006 OCs TMDLs technical staff report (see Section 8.3.2) and the proposed Basin Plan amendment (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 2. Since it is recognized in the TMDLs that most agricultural operations in the watershed are expected to be of limited duration due to the expiration of lands leases, the monitoring and BMP programs proposed by the agricultural operators are expected to include recommendations that are effective, reasonable, and practicable, taking this consideration into account.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #52 (T153-154)

But the strawberry growers represent that trend towards going towards real high input, high cost agriculture. Therefore, unlike areas where they own the land and water may be \$40 a foot, our agriculture here it is characterized by growers who use plastic over most of the production area and drip irrigation.

And most of the period of time when they would be susceptible to any large soil erosion events, which would occur during the winter. That's when they actually have their production on their plastic and drip, so that's been looked at as something that has a minimal impact of terms of erosion in the area.

Response #52

Comment acknowledged. See Response #51.

Comment #53 (T154)

We're looking at something [strawberry production] that obviously is going to have less of a potential to be a major contributor to sediment erosion, especially in the time period of this TMDL. And that it's a particular type of agriculture [strawberries] that's very sensitive to any very expensive type of BMP's.

Response #53

Please see response #51. The agricultural operators in the watershed also have the option of implementing group BMP and monitoring programs, which should help to defray the costs associated with them (see Section 8.3.2 in the November 17, 2006 OCs TMDLs technical staff report and Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 2).

Comment #54 (T154-155)

Any BMP's that we do implement would have to take into consideration the short time frame and then the minimal impact from the type of agricultural operations we have. And the active involvement of all the stakeholders in trying to mitigate this.

Response #54

Comment noted. Please see Response #51.

Comment #55 (T155)

The nursery production here is primarily above-ground containerized production. So their potential for having sediment erosion that has high amounts of DDT are actually minimal if they practice good BMP's because their soil – it's composed of artificial media in above ground containers. And most of your large nurseries in this watershed are under WDR's [waste discharge requirements]. And so they are permitted, they are being monitored. And they have implemented substantial BMP practices.

Response #55

Comment noted. Revisions to existing waste discharge requirements (WDRs) will only be made as necessary. Permit compliance will be based primarily on iterative implementation

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

of effective BMPs (see Section 8.3.1 in the OCs TMDLs technical report; Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 1).

***John Withers, RWQCB Acting Board Chair***

Comment #56 (T168)

It's probably the sentiment of some of the other fellow board members that the parties really attempt to resolve as many of the differences as can be done. And if there's a different approach or a different group that can come into help facilitate it, give it a fresh look whatever it takes because I think in our Region we've always prided ourselves, in the end we apply a little common sense and that we do what we have to do based on our legal charge and our responsibility that we have, but we also try to work with the regulated community to get to a place that everybody gives a little bit and we get the work done.

So I don't have any specific thing other than let's keep trying. I'm distressed to hear the magnitude of the differences. Not small, but big. And so I guess I would just encourage both sides to really keep working on this.

Response #56

Several additional meetings with the stakeholders and Regional Board staff were held to discuss the remaining areas of disagreement on the OCs TMDLs and to solicit input from the stakeholders on the TMDL implementation plan. Regional Board staff and at least certain of the stakeholders achieved apparent consensus to temporarily lay aside the issue of appropriate TMDL numeric targets and move forward with implementation of the TMDLs, provided that certain revisions were made to the TMDL implementation plan to assure that the technical questions would be revisited.

Revisions to the OCs TMDLs Basin Plan Amendment (BPA) include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 7). Pursuant to Task 7, an Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty (in particular, to review and revise if necessary, the TMDL numeric targets) and to direct and advise on TMDL implementation tasks.

Comment #57 (T171)

Could I suggest perhaps -- because we've heard examples of outstanding issues, is it possible that both sides could put together a matrix of the open issues on one axis and the other might be what the current draft TMDL is proposing. What the stakeholders' position might be and then look at the variants in position. A little more formalized base. If we could put sort of a decisional matrix together, at least we could get a common understanding of what the unresolved issues are and sort of a simple graphic and then go to work on those and see what we might be able to do.

***Attachment C2 - Response to Comments from December 1, 2006 Public Workshop  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #57

A matrix was developed as requested by Board member Withers and was included with the supplemental staff report for the April 20, 2007 Public Workshop.

Comment #58 (T173-174)

And I would say to expand on that [matrix] to the extent there's already been a movement in a position if there was an original proposal and there's been modification it would be good to know where there has been some accommodations already in the positions as well.

A lot of good give and take today I thought, and I'm glad that this is a workshop format. I think it was productive, certainly it heightened the issues in a number of our minds and my hope is that parties will remain engaged and keep working together and just see where we can get with this thing, understanding the constraints.

Response #58

See Responses #56 and 57.

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***Maurice Gallarda, RWQCB Board Member***

Comment #59 (T172-173)

I like the idea of a matrix. Instead of having staff go to that effort, what might be helpful is to have the stakeholders produce a matrix since I don't think I saw in any of the presentations what the stakeholders feel are the right numbers.

Response #59

Please see Response #57.



***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

<b>Commenter/Agency</b>	<b>Page Number</b>	<b>Comment Numbers</b>
Dr. Daniel Anderson University of California, Davis	2-9	1-16
Dr. James R. Hunt University of California, Berkeley	9-18	17-30
Dr. Erik Christensen University of Wisconsin, Milwaukee	19-25	31-43

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

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**Daniel Anderson, University of California, Davis**  
**Via E-mail dated January 3, 2007**

Comment #1

Given the diverse and distinguished representation in the original preparation and analyses in this report, along with a diverse and competent group of advisors who met at least three times to discuss various sections of this report in 2006, such a document is highly-likely to be current, scientifically sound, and representative of the most recent risk-assessment approaches to judge, for example, "how much this system can or should be allowed to 'take' from compounds X." The approach combines physical/chemical characteristics with biological characteristics (ex. BCFs) of the various compounds, and then attempts to tie them together with currently-accepted, recently-developed models (in this case as most recently developed by EPA, the TMDL).

Response #1

Comment noted. Regional Board staff carefully considered several alternatives to these TMDLs, including the use of alternative targets, but elected to use the methods and targets that met the requirements of the 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and was consistent with EPA's approach in their technical TMDLs for toxic pollutants for the San Diego Creek/Newport Bay watershed (June 2002).

Comment #2

Given the fairly large (actually huge) body of toxicological and physiological and physical data on which to develop these models for San Diego Creek and Newport Bay, a reasonable, scientifically-based regulatory value should be possible, given the fact that it can and will be updated with new insights from the rather large research and remediation programs associated with future and current applications and research in this specific watershed. And given that this is a fairly well-studied watershed (in comparison to many others in California, but not as well-studied perhaps, for example, as San Francisco Bay), I would still expect reasonable and useful TMDL values, especially given the many outstanding follow-up studies that are listed in the report. I wonder if some kind of comparative data (a paragraph or two) on TMDLs from other systems in California would be useful.

Response #2

There are few other TMDLs for organochlorine compounds that have been adopted in California that provide a direct comparison with the Newport Bay TMDLs. The Los Angeles Regional Board recently adopted "TMDLs for Organochlorine Pesticides, Polychlorinated Biphenyls, and Siltation in Calleguas Creek, its Tributaries, and Mugu Lagoon." While there are some similarities between the San Diego Creek/Newport Bay and Calleguas Creek/Mugu Lagoon systems (mostly in that sediment is the major contributing source of the organochlorine pollutants), they are hydrologically very different. Regional Board staff did review the Calleguas Creek/Mugu Lagoon TMDLs, but elected to adhere as closely as possible to the technical TMDLs for Toxics for the San Diego Creek/ Newport Bay watershed promulgated by EPA in June 2002.

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #3**

Given that these TMDLs reviewed here are for "legacy" organochlorines, it is important that the sources be identified as best as possible, but this is difficult, not because of lack of scientific data but because of "legacy regulatory missions" from the past. I hope that research associated with these TMDLs will be able to "zero-in" a bit better, now that we have more modern regulatory bases and better science to assign regulatory values to ecological phenomena. I assume that the regulatory program has in it this better data-base on which to operate for currently-used and more easily source-identifiable compounds which are no-doubt being introduced into the current system. This is mentioned in your report and I assume the TMDLs for things like Se, etc. will be (are being) developed. I would expect TMDLs for these to be even more supportable through more complete data.

**Response #3**

TMDLs for other toxic constituents that have been identified, such as selenium and metals, are under development. The California Department of Pesticide Regulation tracks the registration and application of modern pesticides such as pyrethroids and carbamates by professional pesticide applicators. In addition, several programs and research projects are tracking the local use and distribution of pesticides in the watershed (UC Riverside Cooperative Extension, Orange County Farm Bureau, Southern California Coastal Watershed Research Project, etc.). The OCs TMDLs implementation tasks include monitoring and assessment of sediment toxicity in the watershed, including monitoring and assessment of emerging contaminants such as pyrethroids and polybrominated diphenyl ether (PBDE).

**Comment #4**

It wasn't immediately apparent to me as a reader of the report (but I didn't study it real carefully), but I assume that some of the current studies will be doing PCB-isomer specific, dioxin, co-planar PCBs, etc. analyses in a representative high trophic-level indicator species in the system (preferably in the lower reaches of the system, where maximum bioaccumulation would be expected to occur).

**Response #4**

SCCWRP is currently conducting a study that is assessing the transfer of organochlorine compounds and trace metals in the fish food web in Newport Bay. California halibut, a high trophic level species in the Bay, are being collected in addition to a variety of fish species from lower trophic levels. All samples, including fish food items, will be analyzed for PCB congeners. For comparison to predator-risk guidelines for PCBs, PCB congener concentrations will be converted to Toxicity Equivalent Quotients (relative to dioxin TCDD). The relative toxicity of PCB congeners will be calculated separately for bird and mammal predators of the fish species sampled.

**Comment #5**

Some of the more sensitive and sophisticated chemical analyses and determinations should be possible from tissue analyses through the (probably already completed) SCCWRP studies which should be reporting to you at the end of this coming March. I don't know which bird species SCCWRP is studying, but (perhaps too late here but still possible

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

for a future study) a common species in the system rather than, say, endangered or listed species should be used as a continually monitored indicator or sentinel species. In these cases, dynamics, etc. of various compounds are essentially the same in species less likely to be affected and therefore more amenable to detailed study, with more data and samples possible, than the species experiencing potential problems, listed, etc. In that regard, I found the limited data on clapper rails to be minimally (or not even) useful for determinations related to the TMDLs in this report. Use of more common bird species, for example, a bit "lower on the food-web" would seem to be instructive. Pharmacodynamics and effects in these species still operate pretty much on a dose/response basis and are highly predictable (for example, the "gull models" developed by the CWS). Isotope studies can also better place your upper-trophic species (fish or fowl) into a more quantifiable trophic position. Basing regulatory values on only listed-species again moves you from an ecological, scientific basis to a more policy basis. Don't just consider the listed species in the system. They will yield you the lesser amount of useful regulatory data. Of course, don't ignore them completely either.

Response #5

SCCWRP and CH2M Hill are nearing completion of a multi-species bird egg study for the watershed that includes birds from a variety of trophic levels and habitats including invertivores (stilts and avocets), herbivores (American coot), omnivores (Pied-billed grebe) and piscivores (Forester's terns, black skimmers). Isotope studies being performed by SCCWRP, as part of their assessment of the food web transfer of organochlorine compounds and metals in fish in Newport Bay, will help in assessing the trophic levels of predators in the bay ecosystem that may be at risk from these compounds. Part of the purpose of the multi-species bird egg study is to help determine appropriate sentinel species for the contaminants of concern (primarily DDE and selenium).

Comment #6

Could you include a short discussion on why the EPA TMDLs of 2002 were basically redone by the Santa Ana WQCB? What were the differences, briefly, in approach and methodology? Is this a routine or sensitive subject? Just knowing the current situation, I would guess that the state's approach is more conservative and perhaps more complete and scientific. I just wondered about this as I read through the report.

Response #6

There are several reasons why EPA's technical TMDLs were revised by Regional Board staff: (1) The State Listing Policy was adopted after EPA's development of the technical TMDLs but prior to development of the Regional Board's OCs TMDLs Basin Plan Amendment (see sections 2.3.1 and 2.4.3 of the November 17, 2006 OCs TMDLs technical report), which required revision of the impairment assessment using the State Listing Policy's recommended methodologies. These differed from the methodology used by EPA to establish the technical TMDLs; (2) Regional Board staff corrected some minor errors in EPA's load calculations and also used more recent fish tissue data to calculate existing loads (section 4.3); (4) EPA did not consider the established sediment TMDLs for Newport Bay and the San Diego Creek watershed in their calculations so Regional Board staff re-calculated the loading capacity based on the sediment TMDLs target of 62,500 tons per year for Newport Bay (section 5.2); and (5) EPA is not required to develop an

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

implementation plan as it is the Regional Board's responsibility to do that; therefore, Regional Board staff developed an implementation plan to complete the TMDLs (section 8 of the November 17, 2006 OCs TMDLs technical report).

Comment #7

On Table 2-2, I wondered why PCBs and PCB-like compounds were not interpreted through the TEQ [Toxicity Equivalent Quotient] approach. Would at least this not warrant some further study with very sophisticated analytical chemistry (say, in a representative series of samples or some representative pools?). I know it is expensive. I see that in Table 2-5, the TEQs for birds and mammals are mentioned. Realizing that the clapper rail samples were the only wildlife values represented, there would be no other data to evaluate for TEQs unless a high trophic, resident fish (page 20) could be evaluated on this basis. What am I missing here? I just have to accept the other values in the same table.

Response #7

Table 2-2 (page 12 of the November 17, 2006 OCs TMDLs technical report) lists the ambient water quality criteria for organochlorine compounds from the California Toxics Rule (CTR). The CTR did not use the TEQ approach for PCBs. The CTR ambient water quality criteria for PCBs is based on the sum of seven Aroclors (1242, 1254, 1221, 1232, 1248, 1260, and 1016) and the human health criterion was derived using a cancer potency factor of 2 per mg/kg-day, and upper bound potency factor reflecting high risk and persistence. This approach was based on multimedia studies that indicated that the major pathway of exposure to persistent toxic substances was through diet, primarily consumption of contaminated fish and shellfish (CTR section F.3d). The TEF (Toxicity Equivalency Factor) approach was only used to develop the dioxin (2,3,7,8-TCDD) criteria (CTR section F.3a). Table 2-5 (page 19 of the November 17, 2006 OCs TMDLs technical report) references TEQs (Toxicity Equivalent Quotients) for mammal and avian diet, as these are the water quality guidelines recommended by the Canadian government for the protection of aquatic life. The State Listing Policy recommends the use of the OEHHA screening values for human health assessment and NAS guidelines for protection of aquatic life in impairment assessments; therefore, the Canadian guidelines were not used. At this time, there are not sufficient data available to use TEQs, though studies currently in progress will ultimately provide this information (see Response #4). Additionally, as part of the revised TMDL implementation plan, an Independent Advisory Panel (IAP) will be established during implementation to help guide special studies and implementation actions. The IAP can evaluate the PCBs data collected to date and assess whether further study of this issue is warranted.

Comment #8

On page 24, when "adverse effects were caused by DDT or its metabolites", does this mean the different forms are analyzed and interpreted separately. With DDE, some agencies (I think EPA and some state agencies I have talked-to) have developed eggshell thinning indices as an easily-measurable endpoint for DDE effects, because shell thinning has been so well and extensively studied. This would be quite easy to do with some kind of indicator species (page 26), such as one of the ardeids in the Newport Bay (upper?) system. I just do not know which species nest there, but would guess there is a colony of DCCO [Double-crested cormorant] or ardeids (such as BCNH [Black-crowned night heron])

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

or GBHE [Great blue heron], that could be sampled, perhaps a tern other than LETE [Least tern]) that could be studied (and sampled).

**Response #8**

See Response #5. Bird eggs were analyzed for Total DDTs, 2,4-DDE, 4,4-DDE (*p,p'*-DDE), 2,4-DDD, 4,4-DDD, 2,4-DDT, 4,4-DDT. As expected, mostly *p,p'*-DDE was detected in the eggs. Eggshell thicknesses were also measured and compared to *p,p'*-DDE concentrations. Measurements of avocet and stilt eggshells collected from the San Diego Creek watershed as part of the SCCWRP multi-species bird egg study showed some thinning compared to reference eggs collected from Nevada in 1991 (Robinson and Oring 1996, 1997) that appears to correlate with *p,p'*-DDE levels. This would appear to support the limited clapper rail data collected in the earlier study and referenced in the TMDLs.

The freshwater areas in the watershed are highly urbanized with nesting locations generally limited to the marshes and in-line sedimentation basins and riparian areas at the downstream end of San Diego Creek. Nests from clapper rails, Forester's terns, Least terns, Black skimmers, avocets and stilts were found in and around Upper Newport Bay. Though Double-crested cormorants, Black-crowned night herons and Great blue herons are present in the watershed, no nests or eggs were found during the study. However, eggs from Pied-billed grebes, Black skimmers and Forester's terns were collected and analyzed for organochlorine pesticides, PCBs, selenium and metals.

**Comment #9**

The current field data demonstrate very convincingly that OC residues have and are declining in the system and that levels have become very low, and expectations are that TMDLs will continue to show this (perhaps accelerated by remediation). I wouldn't expect direct toxic effects any more (even eggshell thinning) but perhaps some endocrine disruptions and perhaps biomarker effects that would be physiologically demonstrable but perhaps might not be ecologically relevant, i.e., such minor effects might logically be compensated-for in the biota. Don't know if this is worthy of discussion, however, as it just brings up more unknowns.

**Response #9**

Trend monitoring will continue during implementation. Additional special studies are also planned during the implementation phase of these TMDLs to determine impacts to fish and wildlife in the watershed. These studies may include assessment of indirect toxic effects such as nest productivity, or number of fledged young/nest, in addition to eggshell thinning and hatching success. The natural attenuation of these compounds is recognized and the implementation plan is structured to enhance or supplement that process. Future investigation may demonstrate that TMDLs for one or more of the organochlorine compounds are no longer necessary; in that case, the TMDLs could be removed through an appropriate 303(d) delisting process.

**Comment #10**

Regarding the use of sediment residues, sampling them is good because of the known relationships between sediment samples and organisms that seem in most cases better than water samples, but I also wonder if the sediments aren't "sequestering" some of the

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

contaminants in some instances. It would seem that this is an interesting question to pursue and it might relate to declining residues in the biota so adequately demonstrated in this report. I think that "story" is worth a publication, by the way.

**Response #10**

Staff are aware of the declining trends in sediment residues, though in most cases those trends are not nearly as well defined as in the earlier (pre-1990s) data. During implementation, these trends will continue to be monitored and special studies are planned to assess the relative contributions of sediments coming from the upper portions of the watershed compared to the re-suspension and redistribution of contaminated sediments within Newport Bay.

**Comment #11**

In the bay, exceedences seem clear enough, as speculated, through bioaccumulation, but it is not clear if they are local in some cases. San Diego Creek and the drainages of the Tustin Plain seem clearly impeded, and the most conservative ("safest") approach seems to develop TMDLs for anything that exceeds or might be expected to exceed safe levels. The development of informational TMDLs is also a good idea. The more information, the better.

**Response #11**

Commented noted. Additional studies being conducted by SCCWRP should determine whether bioaccumulation is occurring throughout the Bay, or only at specific locations (hot spots) or within certain types of food webs.

**Comment #12**

I wonder about looking at PBDEs. Perhaps it is already being done.

**Response #12**

Regional Board staff has initiated a tissue and trend monitoring program for the watershed that includes the collection of sediment, fish tissue and water column samples and the deployment and collection of mussels for bioaccumulation. The samples are being analyzed for the current TMDL constituents (selenium, metals, organochlorine compounds) as well as polybrominated diphenyl ethers (PBDEs) and pyrethroids. The sampling and analyses are being performed by the California Department of Fish and Game (DFG) and are following the methods established for the Toxic Substances Monitoring Program (TSMP) and State Mussel Watch Program (SMW) under the Surface Water Ambient Monitoring Program (SWAMP) protocols.

**Comment #13**

I would say the most important work regarding sensitive wildlife work (birds, amphibians?, reptiles?) is not done. Will the SCCWRP study help out on this question?

**Response #13**

SCCWRP is currently conducting two studies, and the DFG is also conducting a monitoring program, which will significantly add to our knowledge of the effects of organochlorine compounds in fish and wildlife. The multi-species bird egg study collected bird eggs from a

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

variety of species including invertivores, herbivores, omnivores and piscivores, fresh and saltwater fish, tadpoles (African clawed frog), turtle eggs (red-eared sliders), and bird food items such as plants and invertebrates. SCCWRP is also conducting a study that is assessing the food web transfer of organochlorine compounds and trace metals in fish in Newport Bay. DFG is conducting trend monitoring in the watershed that includes the sampling and analysis of fish and mussel tissue, sediment and water for metals, selenium, organochlorine compounds, PDBEs, and pyrethroids.

**Comment #14**

A minor typo? Page 44, first sentence after "DDT." If you have information that DDT use began in the 1930s, I would be astonished; as its insecticidal properties were only discovered in 1939 and it was a military secret throughout World War II. I'll bet you mean the 1940s (after the war was over).

**Response #14**

You are correct; it was a typographic error and will be listed under the errata in the supplemental staff report.

**Comment #15**

On page 46, end of second paragraph, several statements seem a bit unclear. First "brown pelican seems to be the most susceptible to adverse biological effects." I don't think this is true. For example, DCCO [Double-crested cormorant] may be more susceptible or at least equally susceptible. The brown pelican is the most-studied, and therefore the most well-known to have been affected by these legacy pollutants. BRPE [Brown pelican] is now being reviewed by CA and USFWS for de-listing because of its recovery from DDE. Brown pelicans barely use the study area (the coastal parts) and do not breed there (but fairly close). And the statement of a threshold of 3 ppm ww for eggshell thinning in the BRPE, I am sure comes from studies in the east by Blus and colleagues. The reference given is EPA 2000, but there are two (unlikely) references given, 2000a and 2000b. Given this is not even a major part of the TMDL evaluation, one wonders why it is even (a bit carelessly) mentioned. I do know this literature very well, and it gives me a little "pause" regarding citations I am much less familiar-with. Just a word of caution here not to appear careless! I am on your side.

**Response #15**

The correct reference is from USEPA 2000b, "Appendix to Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment. Status and Needs. Chemical-Specific Summary Tables. EPA 823-R-00-002." The statement on page 328 of that report is as follows "Studies have shown the brown pelican to be most susceptible to adverse effects, with eggshell thinning and depressed productivity occurring at 3.0 µg/g of DDE in the egg and reproductive failure when residues exceed 3.7 µg/g [13]." Blus is indeed listed as the reference: "Blus, I.J., 1996. DDT, DDD, and DDE in birds. In *Environmental contaminants in wildlife*, ed. W.N. Beyer, G.H. Heinz, and A.W. Redmon-Norwood, pp. 49-71. Lewis Publishers, Boca Raton, FL." The inclusion of this information in the referenced paragraph in the November 17, 2006 staff report was to summarize the known adverse biological effects of DDT and its isomers to plants and wildlife using a variety of sources and references. While Blus was the original source for this information,



***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

the statement in the staff report was taken directly from the EPA document referenced. According to Dr. Harry Ohlendorf (electronic mail dated February 2, 2007; Attachment E) cormorants are not among the most sensitive species to the effects of DDE, though their eggshell quality and reproductive success has been affected.

**Comment #16**

However and overall, this is an impressive document, I think well supported by the science of ecotoxicology, the data, and the data analysis; and then, to even be further documented with the impressive follow-up studies now underway and soon to be in your hands. I have no serious problems with the report, and it promises to get even better with more science coming-in.

**Response #16**

Comment acknowledged. Regional Board staff are hopeful that the special studies currently underway, and those recommended as part of the Phase 1 implementation portion of these TMDLs, will resolve many of the questions regarding the sources and impacts of the organochlorine compounds in the San Diego Creek/ Newport Bay watershed.

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***Dr. James R. Hunt, University of California, Berkeley  
Comment letter date April 30, 2007***

**Comment #17**

Arriving at Total Maximum Daily Loads within evolving watersheds is a complex task that requires considerable judgment and integration across a wide range of scientific disciplines. What is immediately apparent for this proposed action is that the environmental regulatory framework adopted in the United States over the last 40 years is having an effect. California and the United States have recognized that DDT, PCBs, Chlordane, and Toxaphene were environmentally persistent and toxic to the environment. Their removal from production and use has resulted in declining concentrations in biota, but the time required for improvements are unfortunately measured in tens of years. Given the presence of these compounds and mixtures in the San Diego Creek/Newport Bay watershed at levels anticipated to cause impairment, watershed planning is needed to guide further improvements.

**Response #17**

As part of the revised implementation plan for these phased TMDLs, the opportunity is provided to utilize a holistic watershed approach to design and prioritize monitoring, source assessment, potential impacts and remediation of organochlorine compounds and other potential sources of toxicity such as selenium, metals and emerging contaminants like PBDEs and pyrethroids. This approach would be through the development of a work plan by a working group of stakeholders (which includes local agencies, developers and environmental groups) to prioritize and synchronize special studies, monitoring, source analysis and remediation (primarily through source controls and iterative best management practice [BMP] implementation). In addition, an Independent Advisory Panel (IAP) will be

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

established to help address/resolve areas of uncertainty and to direct and advise on work plan tasks.

Comment #18

The basin plan amendment wisely recognizes the critical importance of sediments in the partitioning of these organochlorine compounds and in determining the fate of these compounds within the watershed. The very high hydrophobicity of these compounds as quantified by the octanol water partition coefficient,  $K_{ow}$ , predicts that the concentrations dissolved in water will be very small and difficult to measure. Models are therefore needed to address partitioning and bioavailability.

Response #18

The State of California is in the process of developing sediment quality objectives (SQOs) for enclosed bays and estuaries. These are expected to be narrative objectives with guidance on deriving protective sediment concentrations. As part of this effort, San Francisco Bay and Newport Bay are being used to develop an empirical and mechanistic food web model to calculate protective sediment concentrations for legacy pesticides and PCBs. The SQOs are expected to be completed and adopted by 2009 and these may be used to revise the proposed OCs TMDLs sediment numeric targets, and the TMDLs themselves.

Comment #19

Given the importance of compound sorption to sediments, sediment control in the uplands portion of the watershed is needed to minimize sediment erosion and deposition in sensitive downstream habitats. There are also concerns with the release of the sediments through erosion during extreme hydrologic events and eventual deposition within the creek channels, Newport Bay, and perhaps in the coastal waters.

Response #19

Comment noted. Extensive efforts have been and continue to be made in the watershed to address erosion and siltation problems. Sediment TMDLs for Newport Bay and the San Diego Creek watershed have been established and are being implemented. These TMDLs are being reviewed and may be revised. The implementation plan for these TMDLs includes measures to control and reduce sediment loads from upland areas in urban storm water flows and construction runoff and from nurseries and agriculture through the revision of permits, evaluation of appropriate BMPs, and monitoring (see Sections 8.3.1, 8.3.2 and 8.3.4 of the staff report).

Comment #20

On page 37, the [Basin] Plan Amendment states that because of the large number of assumptions required to apply Equilibrium Partitioning, a different approach was followed to arrive at numeric targets. Concepts of equilibrium partitioning appear throughout the Plan Amendments with some unanticipated consequences. It thus appears odd to say that equilibrium partition has not been applied.

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #20

This particular statement on page 37 (of the November 17, 2006 OCs TMDLs technical report) refers only to the fact that the *sediment numeric targets* were not specifically calculated for the Newport Bay watershed using the equilibrium partitioning method and local data. It is not meant to refer to equilibrium partitioning with regards to the TMDLs as a whole.

After consultation with USEPA staff, it was determined that sufficient site-specific data were not available to generate reliable numeric targets for sediments in the Newport Bay watershed using the equilibrium partitioning method. Small differences in the octanol-water partitioning coefficient ( $\log K_{ow}$ ) and total organic carbon (TOC) could result in large differences in the numeric targets. Therefore instead, staff elected to use effects-based guidelines for the majority of the sediment numeric targets, as did USEPA in their 2002 Toxics TMDLs for the San Diego Creek/Newport Bay watershed. However, as a result of the complex composition of toxaphene (it is a mixture of about 670 different chlorinated compounds), effects-based guidelines for toxaphene were not available. Therefore, the lowest, most conservative value derived using the equilibrium partitioning method – in this case, the State of New York's equilibrium partitioning-derived target for toxaphene – was selected for the numeric sediment target for toxaphene.

Comment #21

On page 45, Table 4-1 utilizes equilibrium partitioning to relate organochlorine partition coefficients to octanol water partition coefficients. First, in footnote (a) the relationship has an error and should probably be written as  $\log K_{oc} = 0.00028.0 + 0.983 \log K_{ow}$  and the contribution of the term 0.00028 is minimal and could be dropped. The ratio of Bioconcentration Factor to the octanol water partition coefficient,  $BCF/K_{ow}$ , should be a measure of the lipid fraction in the organism assuming equilibrium partitioning. In calculating that ratio for the organochlorine compounds in Table 4.1, the values range from 0.018 for Chlordane to 0.16 for Toxaphene, which suggests data from difference sources and for different organisms are being combined (footnote (k)). For consistency, the same reference organism should be used. The bioconcentration factor from Table 4-1 is critical in the subsequent analysis.

Response #21

The error noted in the equation will be corrected in the supplemental staff report. The selected BCF values were organism specific. We used the same BCF values and  $K_{ows}$  used by EPA in their technical TMDLs for Newport Bay. In general, EPA used their Water Quality Criteria documents, which provide organism-/species-specific values, to select the BCF values. Where appropriate, they used BCF values for Fathead minnows as the most common tested biological species. For DDT, EPA selected a BCF value for common shiner (*Notropis cornutus*). For  $K_{ow}$  values, they reviewed and carefully scrutinized the scientific literature to select the appropriate values for each organochlorine chemical. EPA recognized that there is considerable debate regarding the appropriate chemical specific  $K_{ow}$  values, and after public input, they selected  $K_{ow}$  values that were consistent with the "slow-stirring" approach cited in de Bruijn et al. (1989) and supported in the U.S. Geological Survey (USGS) review (2001).

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Comment #22

The model for calculating existing loads appears in equation (5) on page 62. This model appears simple but has within it many assumptions that might be in conflict. A measured tissue concentration (TC) divided by a literature value of the bioconcentration factor is an estimate of the equilibrium organochlorine concentration dissolved in water. The total suspended concentration is then obtained by dividing by the fraction that is dissolved and this comes from an equilibrium sorption model appearing in equations (9) and (10). Hydrologic variability is then incorporated by picking three different flow tiers and summing up the contributions, although the summation sign is missing from equation (5). As is demonstrated in Figures 2-6 through 2-8, there are substantial differences in tissue concentrations in winter and summer, suggesting either fish migration or rapid exchange of these organochlorine compounds between these organisms and the environment. It is my understanding that compounds with octanol water partition coefficients in the range of these organochlorine compounds are not readily purged from organisms over the seasonal time scale. This appears to be a case where an equilibrium partitioning model is being adopted continuously over the seasons when the system is not at equilibrium. Bioconcentration factors appear in Table 4-1 and are used in Table 4-7 for this estimate of loading, but those numbers were variable due to different organisms. This is inconsistent with the intent of arriving at an annual loading. The model needs greater development, justification and description.

Response #22

Existing loads in San Diego Creek were estimated using the same process as was used by USEPA (2002). That procedure utilized the geometric mean of recently-measured tissue concentrations in *Cyprinella lutrensis* (red shiner) collected in 1998 during monitoring conducted for the TSMP (USEPA 2002), and the bioconcentration factors (BCFs) obtained from scientific literature. In the revised TMDLs proposed by Regional Board staff, recently-measured fish tissue concentrations were used to best represent current conditions. The geometric mean of red shiner and fathead minnow tissue concentrations from TSMP samples collected in 2002 (the most recent data available at the time the staff report was being prepared) were used in calculations of existing loads along with BCFs derived from the literature for fathead minnows and common shiners, a close relative of red shiners. Note that our calculations resulted in lower existing loads than what EPA had calculated in their TMDLs. This is likely a result of the continuing decline of these compounds in fish and sediment in the watershed.

The differences in fish tissue concentrations in winter verses summer samples is not a statistically-supported trend for DDT. Some resident fish species, such as arrow goby and California killifish, actually show opposing trends. For example, the DDT concentrations measured in the five arrow goby composites collected by SCCWRP in 2000-2002 show higher concentrations in the summer samples compared to the winter samples; however, the opposite is seen in the California killifish. The reason for the apparent seasonal variability in fish tissue concentrations for other contaminants is not known, but may be a result of a variety of confounding factors and not truly a seasonal trend for the following reasons: many of the fish sampled were juveniles, so their tissue concentrations would only represent recent accumulations of contaminants; populations and number of fish species differ dramatically from summer to winter; different sampling methods were used at

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

different times during the two-year study; and a greater variety and abundance of food sources are available in summer. Longer term monitoring of fish tissue concentrations is needed in order to determine if a true seasonal component to the contaminant trends exists.

While it is acknowledged that the San Diego Creek/Newport Bay watershed is not at equilibrium seasonally (similar to any other natural system of this type), the loads were calculated using the best and most recent data available with a clear understanding of the assumptions being made and their limitations. Regional Board staff did not have direct measurements of loads and had to use an indirect approach to generate an estimate of organochlorine compounds loads. The organochlorine compounds TMDLs are phased TMDLs and, as more site-specific data are collected, the load estimates and load models will continue to be refined and updated.

**Comment #23**

The sediment transport modeling greatly benefited from earlier work that utilized the 22 years of US Geological Survey records available on the San Diego Creek. While it is computationally convenient to utilize three flow tiers (low, medium and high) and pick the mean values for those flows, there is no documentation that this analysis preserves sediment loading. Since sediment transport via equation (11) is nearly proportional to flow rate squared, extremely high flow events completely dominate in terms of sediment contribution. Since the actual data are available, how does this three tier model compare to the annual sediment loss calculated from measured daily data?

**Response #23**

Equation 11 was used to calculate the loading capacity for Upper and Lower Newport Bay, but not for San Diego Creek. The loading capacity in San Diego Creek was based on the allowed annual Sediment TMDL load of 62,500 tons per year and is not related to the regression equation between flow and sediment load (equation 11) or the flow tiers. At this time, there is no way to directly measure loads and plot them against hydrologic variability during high flow events in the creeks, so the existing loads in San Diego Creek were back-calculated from fish tissue concentrations that were then applied to the three flow tiers.

While the flow tiers may under-predict sediment flows associated with very high flow events (e.g., El Nino 1997/1998 water year, which yielded approximately 618,000 tons of sediment), they also may over-predict sediment loads in the drier years (e.g. 2001-2002 water year, which yielded only 5,600 tons of sediment). The ten-year annual average sediment load for San Diego Creek is currently 116,248 tons (see Response #25). Though sediment loads may differ substantially from year to year, when taken as an average over a 10-year period (as is done in the Sediment TMDLs), the flow tiers are reasonably predictive of the measured long-term average sediment loads in the watershed.

For the annual reporting required by the Sediment TMDLs, the annual sediment loads for San Diego Creek and its tributaries are determined by the County of Orange by summing loads from sampled storms and using a regression equation (equation 11) between mean daily flow and mean sediment discharge to predict the loads from un-sampled storms. The sediment transport curve is updated annually as new data points become available. The

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

County is in the process of revising their sediment transport model since they believe sediment yield is being reduced by the continued and rapid urbanization of the watershed.

**Comment #24**

Sediment and organochlorine loading to Newport Bay is dependent upon an accurate representation of organochlorine concentrations on sediments ( $C_s$ ) and the sediment loading ( $D_s$ ) as is used in equation (12). The organochlorine concentrations are taken from Bay et al. (2004) according to the Amended Plan, but there is no indication of how many measurements were utilized to arrive at this value. Given the variability of sediment concentration with flow rate and the variability of organochlorine concentration with sediment levels (Figure 5-3), there must be considerable uncertainty in this estimate of existing load. The sediment loading on an annual basis is estimated in Table 4-8, but there may be a discrepancy with the July 1998 US Army Corps of Engineers Feasibility Report. Table 4-8 reports an annual sediment deposition of 31474.17 m<sup>3</sup>/y for Unit I Basin but in the 1998 USACE report the computed sediment load for the 22 years of record was 354,000 cubic yards for the same Unit I Basin, and this becomes an average annual loading of 12,000 m<sup>3</sup>, which is considerably different from the value found in Table 4-8.

**Response #24**

The location and number of measurements taken from Bay et al. (2004) that were used to calculate existing loads for Upper and Lower Newport Bay are given in the first table in Appendix A-2 in the staff report. The data from the SCCWRP study by Bay and others (2004) were used in these calculations because the study was more spatially representative of the bay than other studies, and the sample locations correlated fairly well with the nodes used in the RMA sediment transport model for the bay.

It appears that the commenter is referring to Table 3 of the July 1998 ACOE report, where the computed net deposition in the Unit I Basin is listed as 354,000 cubic yards and compared to the observed net deposition of 414,000 cubic yards. As indicated in the report text, this is cumulative over the 12-year period from the fall of 1985 through the spring of 1997. The computed net deposition to Unit I during this period is thus 29,500 cubic yards/year (22,554 m<sup>3</sup>), and the observed net deposition is 34,500 cubic yards/year (26,377 m<sup>3</sup>). These data were presented to illustrate calibration of the RMA model. The actual model simulations were run using a longer 25-year sediment loading series, and the net deposition estimated in Table 4-8 is from these runs.

**Comment #25**

On page 65 of the Amended Plan there is the statement that the average annual sediment load was over 100,000 tons per year and the allowable sediment load for Newport Bay is 62,500 tons. There is no discussion of the uncertainty in either of these numbers and they are each likely to be large. The margin of safety of 10% adopted for TMDLs by the USEPA appears to be low. This TMDL process should reflect the uncertainty in the models and resulting estimates should have some range of values specified to clarify the uncertainty.

**Response #25**

The following table presents summary statistics on hydrologic and sediment data for the San Diego Creek Watershed.

**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

San Diego Creek Watershed Data	Annual Summary Statistics					
	Min	Max	Mean	Median	Std	CV
Tustin-Ranch Rainfall (in.)	4.22	34.7	13.6	11.2	7.2	0.53
Discharge (acre-feet)	10,610	92,345	33,441	27,154	20,981	0.63
Sediment load (tons)	5,640	618,006	121,538	43,599	169,068	1.39

The rainfall data in the above table is for the years 1962-2006, while the flow and load data for San Diego Creek covers the period 1983-2006. The ten-year annual average sediment load for San Diego Creek is currently 116,248 tons.

As indicated by the coefficient of variation (CV), the annual sediment load has a much greater variability than the annual rainfall, or flow volume. This may reflect the variability in the storms that result in erosive flows, as well as physical changes in the watershed associated with urbanization. The annual sediment load is determined by the County by summing loads from sampled storms and using a regression equation (sediment transport curve) between mean daily flow and mean sediment discharge to predict the loads from unsampled storms. The coefficient of determination ( $R^2$ ) for the curve is typically around 0.9. The sediment transport curve is updated annually as new data points become available.

To account for the variability and uncertainty in the TMDLs, in addition to the 10% margin of safety, the TMDLs were also developed using a conservative approach, as discussed in more detail on page 77 of the November 17, 2006 staff report. The load estimates are based on the best and most recent data available. However, due to the large number of assumptions that went into these calculations, and the large differences in load estimates that could result from minor changes in some of these assumptions, such as the use of different  $K_{ows}$ , or BCFs (see Response #20), or different sediment transport curves, it is not practical to provide a range of values to clarify the uncertainties associated with these assumptions. Additionally, the load allocations are often incorporated into NPDES permits and a range of values would complicate both establishing effluent limitations and determinations of compliance. These TMDLs are phased and allow for revision and refinement of the loads as new information becomes available. The loading numbers, however, do match fairly well with two other independent sources of data – the actual volume of sediment dredged and the net deposition calculated by the periodic bathymetry surveys. In addition, a beryllium isotope study by SCCWRP was consistent with the load data. Therefore it seems reasonable to use a 10% margin of uncertainty.

**Comment #26**

Hydrologic variability is recognized on page 79, but Figures 7-1 through 7-3 are not reflected in the TMDL analysis. Given the high variability in flow, the high variability in sediment loading, the high variability in organochlorine loading, and the seasonal variability in fish tissue concentrations, the overall analysis does not recognize this or carry along an uncertainty in the estimates. Significant data uncertainties are mentioned on page 81, and there are many ongoing projects that will assist in some of these efforts as summarized in Section 8.2 (page 82), but the level of detail in the summary is not sufficient to indicate if the details of hydrologic variability will be fully represented.

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #26**

The variability inherent in this type of analysis is implicitly recognized in the OCs TMDLs. To account for the variability and uncertainty in the TMDLs, in addition to the 10% margin of safety, the TMDLs were developed using a conservative approach. As discussed in more detail on page 77 of the November 17, 2006 OCs TMDLs technical report, the loading capacities are linked to the sediment TMDL target values, which are long-term (10-year) annual averages that should reflect both maximum and minimum sediment loads to the Bay. The sediment transport model developed by RMA that was used in the TMDLs load calculations may now actually overestimate the amount of sediment being discharged to the Bay as the watershed has become increasingly urbanized since the data used in the regression model were collected (sediment transport data from 1985-1997). On page 79 of the staff report, it is also recommended that because of the pronounced seasonal relationship between sediment discharges and rainfall, and because of the long-term nature of adverse OCs effects, that compliance with the proposed TMDLs be measured over a relatively long time period and evaluated based on the average annual loadings, rather than on a daily basis. (TMDLs expressed as daily averages are proposed, in addition to those based on annual averages, in response to legal requirements.)

At this time, there is no way to directly measure loads and plot them against hydrologic variability during high flow events in the creeks. The County of Orange is currently conducting a study to evaluate legacy organochlorine pesticides and PCBs mass loadings with respect to geographic location, flow, sediment particle size, and total organic content within the San Diego Creek/Newport Bay watersheds. The information gathered by the study will assist with the quantification of existing loads and identification of active sources and appropriate BMPs (see page 83 of the November 17, 2006 OCs TMDLs technical report). Implementation tasks 8.3.4 and 8.3.8 in the staff report (pages 91 and 95, respectively) also include tasks that should result in further refinement to estimates of mass loadings of the organochlorine compounds. For example, one task requires that the temporal and spatial trends of organochlorine compounds concentrations in water, sediment and tissue be assessed so that the variability and uncertainty associated with these parameters can be better defined.

Given the extremely small loads that have been estimated for these compounds (grams per year), the difficulty in direct measurement of these loads, especially under high flow conditions, and the long time frame between cause and effect in biota, it is likely that modeling of sediment transport in the creek will be needed to provide a better estimate of the organochlorine concentrations associated with the sediments in the creeks in the inland areas of the watershed. For Newport Bay, the RMA model will be revised and updated to include newer data (including the changed bathymetry in the bay that will result from the dredging operations that have or are taking place in Upper and Lower Newport Bay) and will be run for fine particulates under varying flow conditions to provide better modeling of sediment distribution patterns that are most likely associated with organochlorine compounds (see page 84 of the November 17, 2006 OCs TMDLs technical report). The proposed TMDL implementation plan also recommends that a special study be conducted to estimate the relative contributions of contaminants from the inland areas of the watershed to those associated with sediments in the Bay that are being potentially re-suspended and re-circulated during tidal fluctuations or storms.



***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #27**

As the watershed transitions from range land to agriculture to a mix of commercial, residential and open space, there will be a corresponding change in water quality impacts on the environment. While organochlorine compounds are no longer used or released to the environment, there are many other products available to consumers and landscape professionals that are applied intentionally or non-intentionally on the land surface in commercial and residential areas that may be impacting receiving waters. It would be helpful if the monitoring programs put in place for implementing this Plan Amendment included some anticipatory monitoring. For example I would expect that sediment loads temporarily increase during the transition to commercial and residential land use, and decline following the establishment of more mature vegetated surfaces. Additional loading from crankcase oil, pesticides, fertilizers, animal wastes, and trash might be anticipated and perhaps prevented through a more holistic look at water quality non-degradation rather than waiting for contaminants to emerge with observable environmental impacts.

**Response #27**

Staff agrees with the commenter that the changes in land use in the watershed that have, are, or will occur, will also result in water quality impacts on the environment. The conversion of land use in the watershed is acknowledged in the OCs TMDLs. Because much of the land that is currently being converted to urban uses was once agricultural lands that may contain soils that still have concentrations of organochlorine pesticides, the implementation plan includes a task (described in section 8.3.4 of the November 17, 2006 OCs TMDLs technical report) to require that construction sites measure organochlorine concentrations in both storm water and non-storm water discharges (see page 92 of the staff report). In addition, revisions to the TMDL include more emphasis to developing a comprehensive holistic Work Plan (see task 8.3.7 in the technical report and Response #17) that will address both current and emerging contaminants and will compliment and enhance monitoring conducted under the Municipal Separate Storm Sewer System (MS4) permit, the Nutrient Regional Monitoring Program (RMP), and the Sediment and Fecal Coliform TMDLs. Regional Board staff has also initiated a tissue and trend monitoring program for the watershed that includes the collection of sediment, fish tissue and water column samples and the deployment and collection of mussels for bioaccumulation. The samples are being analyzed for the current TMDL constituents (selenium, metals, organochlorine compounds) as well as PBDEs and pyrethroids. The sampling and analyses are being performed by the California Department of Fish and Game (DFG) and are following the methods established for the Toxic Substances Monitoring Program (TSMP) and State Mussel Watch Program (SMW) under the Surface Water Ambient Monitoring Program (SWAMP) protocols.

**Comment #28**

The Amended Plan could be improved if there was more attention to including only significant digits in numerical values. For example in item #5 above, it was reported that sediment load was 31474.17 m<sup>3</sup>/y when it would have been just as accurate to write 32,000 m<sup>3</sup>/yr.

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #28

Comment noted.

Comment #29

On page 51, there is concern expressed that groundwater might be a significant pathway for organochlorine transport based on a January 2006 monitoring report. It is highly unlikely that groundwater will be a significant transport pathway for highly hydrophobic organochlorine compounds, and Table 4.4 indicates there were no organochlorine compound detections. In an era of limited financial resources, it is important to devote those resources to important issues and not get side-tracked with other matters of lesser importance.

Response #29

Comment noted. The statement in the staff report was predicated on the analytical results received for groundwater samples that were collected from monitoring wells in a shallow aquifer that showed detections of DDT. Subsequent monitoring also showed similar concentrations of DDTs in groundwater samples and DDT has also been found in groundwater samples collected in the Calleguas Creek watershed in the Los Angeles region. Regional Board staff will be asking the analytical laboratory to determine whether or not the reported detections are real or the result of analytical error or cross-contamination. The shallow aquifer that underlies portions of the San Diego Creek watershed provides around 85% of the perennial flows in San Diego Creek and its tributaries. If organochlorine compounds are pervasive in this aquifer, even though they may be at very low concentrations, the high volume of groundwater present as base flows in the creek that enter the Bay may in fact prove to be a significant long-term source of these contaminants. However, the primary focus of future studies and BMP implementation is on further reducing organochlorine compounds associated with sediment loads, not groundwater, and it is likely that these detections in groundwater are either an artifact from the analytical laboratory or sampling equipment or are limited in extent.

Comment #30

Arriving at appropriate TMDLs for complex watersheds is a challenge that can be met through exhaustive data analysis, modeling, and measurements as has been undertaken for the San Diego Creek/Newport Bay. The Amended Plan has made a good start at developing the necessary modeling approaches and data analysis for predicting future conditions and anticipating actions required to meet water quality objects. The appropriate combination of modeling, monitoring, and analysis is a logical means of protecting the water quality for the future.

Response #30

Comment noted. The phased nature of these TMDLs allows us to move forward with an implementation plan that includes measures to reduce sediment loads, and thereby reduce organochlorine compounds loads, provides a reasonable compliance timeframe that will allow refinement/revision of numeric targets and loads as additional data are collected and analyzed, and will institute additional monitoring that will compliment current monitoring efforts and will help to determine the effectiveness of implementation actions so that beneficial uses in the watershed are protected.

**Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

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***Dr. Erik R. Christensen, University of Wisconsin, Milwaukee  
Via e-mail review letter dated May 2, 2007, revised May 4, 2007***

Comment #31

Note that Food and Drug Administration (FDA) criteria are less stringent than OEHHA criteria for fish tissue concentrations of total PCBs (Table 2, Appendix B, Rose 2006). For example, FDA's limit for PCBs is 2000 ppb compared with OEHHA's more stringent limit of 20 ppb. Sediment quality guidelines are given in Table 3 of Appendix B (Rose 2006). Sediment toxicity data are more scattered, but contaminated sediments do show some effect, for example for chlordane in Upper Newport Bay where 27/36 samples exceeded the NOAA ERM of 6 µg/kg dw (Appendix B, Rose 2006. Note: page numbers should have been included in the appendices). Water quality criteria exist (Table 1, Appendix B, Rose 2006) but most measurements show nondetectable concentrations with the methodologies used.

Response #31

Comment noted. OEHHA fish tissue screening values for human consumers of fish were used in the impairment assessment and as numeric targets for fish tissue concentrations. FDA Action Levels are only provided in the report for comparison purposes. Staff will be looking at sampling and analytical methods that will provide better detection limits for organochlorine compounds in water, sediment, and fish tissue. The implementation plan recommends that additional studies of the linkage between toxaphene concentrations in sediment and fish tissue be pursued, as there is a large degree of analytical uncertainty with measurements of toxaphene in environmental samples that use standard methods.

Comment #32

Fish and to a lesser extent sediment concentrations indicate that there is a valid concern for water quality with respect to organochlorine compounds in San Diego Creek and Newport Bay. This is despite the fact that concentrations are declining because of the ban on these compounds.

Response #32

Comment noted. This is why TMDLs are being developed for organochlorine compounds in San Diego Creek and Newport Bay.

Comment #33

The numeric targets for organochlorine compounds for the water bodies are given in Table 6-1a (USEPA 2002) and Table 3.1 (Rose 2006). They are in general agreement except for total PCBs in fish tissue of Newport Bay (30 vs. 20 ppb). The values seem to be reasonably well established except that further rationale should be given for human health vs aquatic life target values (Rose 2006). PCBs should be analyzed by congener and not aroclor since congeners can be very different in their toxicity. Co-planar congeners or dioxin-like PCBs are generally considered to be more toxic.

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #33**

The total PCBs fish tissue concentration listed in Table 6-1a in the 2002 USEPA TMDLs is incorrect. The correct OEHHA fish tissue screening value for PCBs is 20 ppb (wet weight) as shown in Table 3.1 of the November 17, 2006 OCs TMDLs technical report (Rose 2006). PCBs have been analyzed by congeners for all monitoring and studies conducted since at least 2000. The Southern California Coastal Water Research Project (SCCWRP) is currently conducting a study that is assessing the transfer of organochlorine compounds and trace metals in the fish food web in Newport Bay. California halibut, a high trophic level species in the Bay, are being collected in addition to a variety of fish species from lower trophic levels. All samples, including fish food items, will be analyzed for PCB congeners. For comparison to predator-risk guidelines for PCBs, PCB congener concentrations will be converted to Toxicity Equivalent Quotients (relative to dioxin TCDD). The relative toxicity of PCB congeners will be calculated separately for bird and mammal predators of the fish species sampled.

**Comment #34**

The calculations of sediment targets through eq. 3, p. 38 (Rose 2006) is reasonable. A better rationale for using NAS guidelines for fish tissue targets is needed. It is not clear how fish tissue targets were calculated. The calculation of targets for human health protection through the 70 yr, 70 kg body weight calculation may be ok provided that consideration is given to declining input concentrations and that dose-response factors need to be well determined (p. 38, Rose 2006).

**Response #34**

The NAS guidelines and OEHHA screening levels that were used for numeric fish tissue targets for the protection of wildlife and human consumers of fish are specifically recommended by the 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) for use in impairment assessments. The freshwater NAS guideline for DDT is applied to both aquatic plants and animals on an individual basis and is less specific in its intent than the marine guideline. The marine NAS guideline for DDT is specific to the piscivorous food web; the guidelines are based on composites of fish in the size range consumed by the birds or mammals of concern. Given the fact that many species of birds, including the endangered California Least Tern, forage in freshwater, estuarine, and marine environments, the more conservative of the two NAS guidelines would have to be met at all these locations to ensure protection of those species. As we do not have access to all of the data that the different NAS panels used, we cannot judge why different values for freshwater and marine aquatic life were obtained.

The human health fish tissue targets are based on the 1999 OEHHA fish tissue screening values, which were calculated based on a  $10^{-5}$  cancer risk. While both the NAS- and OEHHA-based numeric fish tissue targets do not take into account the declining concentrations of these contaminants, their attainment is expected to result in the restoration and protection of the beneficial uses in the watershed. The proposed TMDL implementation plan recognizes that concentrations of these contaminants are declining and incorporates tasks that are designed to enhance or supplement this natural attenuation. The implementation plan also allows for the refinement/revision of the TMDL numeric targets as more data become available.

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #35**

Some consideration needs to be given to mixture effects in the biological response to many pollutants. For similar compounds toxic units tend to add up, but for different modes of action, there are many possibilities. Generally, mixture effects would lower permissible concentrations and TMDLs. Some further discussion of this issue could be included p. 77, Rose (2006).

**Response #35**

Threshold Effect Levels (TELs) are used as numeric sediment targets in the TMDLs. TELs represent the concentrations below which adverse effects from toxic constituents are expected to occur only rarely. TELs are considered to provide useful tools for identifying sediment quality conditions that are likely to be supportive of healthy, self-sustaining populations of benthic invertebrates in urban embayments that frequently have complex mixtures of various chemicals in the sediments (Dr. Donald D. MacDonald, MESL, comment letter dated February 20, 2007; Appendix E).

The effects of multiple contaminants on biota are poorly understood; while some contaminants may have synergistic effects on organisms, others may result in antagonistic effects. The speciation, isomer, or congener of a contaminant may also react differently with other contaminants than the “parent” compound or sum total of the particular class of contaminants (i.e., coplanar PCBs are more toxic than non-coplanar ones and may interact differently with other chlorinated compounds or metals; also selenium and arsenic may act antagonistically, but the species of As and Se and their relative concentrations determines whether or not they counteract each other). For the organochlorine compounds, concerns have been raised that PCBs and organochlorine pesticides may act synergistically on organisms as they have similar adverse effects on reproduction and infant development (Schwacke et al., 2002). TMDLs, however, generally focus on single-contaminant effects as it is not practical, and the methodologies are not readily available, to try to estimate the effects of mixtures of these contaminants on the biological system. Interactive effects are generally accounted for by incorporating conservative assumptions into the impairment assessments and numeric targets.

**Comment #36**

One recommendation is that source identification should rely not only on enumeration or quantification of known sources but also on receptor modeling. For example chemical mass balance (CMB) and factor analysis using for example positive matrix factorization (PMF) based on pollutant or congener profiles can identify sources and their contributions.

**Response #36**

Since DDT and PCBs present in the Newport Bay watershed are legacy chemicals that result from a variety of uses and applications (i.e., DDT was applied to row crops and used for termite control in urban structures; PCBs were used at military bases and in transformers and paints in shipyards and urban areas) and not from manufacturing facilities present in the watershed, the use of CMB and PMF to determine their original mixture origins (e.g., using PMF to determine source profiles of PCBs to estimate their original Aroclor mixtures) has not been considered. Several studies are being conducted to

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

determine the locations of soils or sediments in upland areas or within Newport Bay that may still, or could potentially, contribute to pollutant concentrations and loadings in the watershed. The Bay Protection Toxic Cleanup Program (BPTCP) and Consolidated Toxic Hot Spots Cleanup Plan (SWRCB, 1999) have identified several contaminant hot spots in California's enclosed bays, estuaries, and coastal areas. The Rhine Channel, located in lower Newport Bay, has been designated a high priority toxic hot spot, and efforts are currently underway to implement remediation of the contaminated sediments in the channel. Sediments in the channel are contaminated with PCBs, organochlorine pesticides and heavy metals. The highest concentrations of PCBs in bay sediments have been consistently measured in the Rhine Channel.

The implementation plan in the November 17, 2006 OCs TMDLs technical report outlines several special studies that are currently underway in the Newport Bay watershed that should help to better define the sources of organochlorine compounds in the watershed (see section 8.2 of the November 17, 2006 OCs TMDLs technical report). SCCWRP has just completed a study to investigate storm water particulates and bedded sediments in Upper Newport Bay (UNB) from a variety of land uses in the watershed using gas chromatography-mass spectrometry (GC-MS), compound specific isotope ratio analysis (CSIA), and chiral gas chromatography (CGC) (Peng et al., 2007; SCCWRP Technical Report 512). Preliminary results of the study indicate that concentrations of trace organic contaminants in storm water particles were greater than, or equal to, the concentrations of trace organic contaminants measured in the UNB bedded sediments and that some trace organic constituents were associated with some land uses more than others (e.g., average storm water particulate concentrations of total DDT at agricultural land use sites was an order of magnitude greater than any other land use examined). The County of Orange is evaluating legacy organochlorine pesticide and PCBs mass loadings in the watershed with respect to geographic location, flow, sediment particle size, and total organic content. SCCWRP is also investigating the transfer of organochlorine compounds within food webs in Newport Bay and identifying trophic pathways of importance to humans and wildlife. This study will also attempt to identify locations in Newport Bay where elevated concentrations of organochlorine pesticides and PCBs in fish tissue and sediment have been observed and correlated so that these areas can be prioritized for remediation.

**Comment #37**

The linkage analysis is fairly well described in USEPA (2002) compared to Rose (2006). The diagrams p. F-1 and F-2 are clear although there should be a division sign between fish tissue and BCF in Fig. F-1, and Fig. F-2 reflects an oversimplification of the problem.

**Response #37**

Comment noted.

**Comment #38**

The case of Newport Bay and to some extent San Diego Creek illustrates the difficulty in using the loading concept in that sediments have a different role in releasing pollutants to the water column depending on sedimentation rate and sediment mixing. Significant mixing in upper sediment layers can release more pollutants to the water column. The role of sedimentation rates and sediment mixing in making pollutants available to the ecosystem

***Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

should be clarified by models and observations. Volatilization could also be considered. This issue should be addressed.

**Response #38**

Section 8.3.9 in the November 17, 2006 TMDLs technical report (page 96) identifies several special studies that have been recommended by the Technical Advisory Committee (TAC) for these TMDLs and/or Regional Board staff that can be used to refine or revise the OCs TMDLs. Study number 5 recognizes that the relative importance of continuing organochlorine compounds discharges to receiving waters through erosion and sedimentation in the upland areas of the watershed needs to be evaluated and compared to the recirculation of existing contaminated bed sediments in the bay. Sediment mixing and sedimentation rates would be essential to this type of study. As discussed in the discussion of the implementation plan (page 84, Section 8.2 of the November 17, 2006 OCs TMDLs technical report), the sediment transport model for Newport Bay is being updated and refined to: (1) predict general sediment deposition rates in the bay under current loading conditions; (2) incorporate revised bathymetry, storm hydrographs, and sediment-flow regression equations; and (3) to predict fine-textured sediment deposition rates and patterns in the Bay to help identify areas of continuing contaminant deposition/recirculation.

**Comment #39**

The pollutant inventory in the Newport Bay sediments should be estimated and compared with annual TMDLs, for example 160 g/yr of DDT input to Upper Newport Bay. I suspect that this and other TMDLs are small compared with the pollutant inventories in the sediments. Thus, even with zero input to the Bay there can be a significant recycling of DDT from bottom sediments which means that it can take a long time before DDT can be delisted. Note, however, that DDT concentrations do decline over the years (Fig. 2-3, Rose 2006). This decline is likely to be influenced both by lower inventories and lower inputs.

**Response #39**

Comment noted. Monitoring and special studies that will be conducted during implementation of these TMDLs will be designed to address this issue. (Please also see Response #38.)

**Comment #40**

Values of TMDLs are listed in Tables 6-5 – 6-8 of USEPA (2002). Similar values of TMDLs proposed by SARWQCB are listed in Table 6-1a (Rose 2006). Load allocations by source type, similar to those in the EPA report are shown in Table 6-2b. The numbers are fairly similar, mostly within a factor 2, for corresponding pollutants, source categories, and water bodies. One significant deviation is for example for chlordane, in Upper Newport Bay from urban runoff. EPA shows 120.5 g/yr and SARWQCB 30.1 g/yr. Another example is total PCBs in Lower Newport Bay which is 409.8 g/yr by EPA and 241 g/yr by SARWQCB. Some further work should be done to seek to clarify or justify these numbers. Clearly, there is significant uncertainty in this evaluation. TMDLs for PCBs and chlordane in San Diego Creek may in fact not be required.

**Attachment C3 - Response to Peer Review Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #40

The reasons for the discrepancy between EPA loads for chlordane and PCBs and Regional Board staff's calculated loads are that (1) EPA used chlordane concentrations as reported in a draft SCCWRP report; subsequently, Regional Board staff found errors in the chlordane data and these were corrected in the final report (Bay et al., 2004) and in Regional Board staff's load calculations; and (2) the lower calculated load for PCBs resulted from the large number of non-detections (NDs) in the data base; in the calculations, Regional Board staff used half the method detection limit to represent these NDs.

The proposed TMDLs for PCBs and chlordane in San Diego Creek are informational only. The impairment assessment conducted by Regional Board staff did not establish impairment due to chlordane or PCBs for San Diego Creek or any of its tributaries (please see page 28, Section 2.4.4 in the November 17, 2006 OCs TMDLs technical report). The informational TMDLs are recommended because for chlordane, data suggest that the existing load of chlordane to San Diego Creek may be greater than the loading capacity. Further, San Diego Creek is the largest source of organochlorine compounds to Newport Bay, which was found to be impaired for both PCBs and chlordane. The lack of a finding of impairment for chlordane (and PCBs) for San Diego Creek may simply reflect a lack of data with which to assess impairment.

The Clean Water Act provides the legal basis for developing TMDLs, for informational purposes, in situations where impairment has not been established. CWA §303(d)(3) states

*"For the specific purpose of developing information, each State shall identify all waters within its boundaries which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margins of safety, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife."*

While such informational TMDLs would have no regulatory effect and would not be implemented at this time, if impairment is established for chlordane and PCBs in San Diego Creek in the future, they would facilitate development of a Basin Plan amendment.

Comment #41

The margin of safety is taken as 10% of the total TMDL. This seems to be reasonable. The area has a strong seasonality as evidenced by the annual rainfall pattern, Fig. 7-1 (Rose 2006). Thus much of the sediment input to the estuary comes during episodic events with a few heavy rainfalls. The implication for BMPs and WDRs is that they must be geared towards an accurate description of these events.



**Attachment C3 - Response to Peer Review Comments**  
**San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #41

Comment noted. The proposed implementation plan recognizes this and is requiring evaluation and revision of existing WDRs and NPDES permits, construction sampling plans and BMPs, and the development and implementation of an agricultural monitoring and BMP program in the watershed (for a description of these tasks, see Section 8.3, Phase I Implementation, in the November 17, 2006 OCs TMDLs technical report).

Comment #42

The implementation plan indicated in Tables NB-OCs-13 and 14 makes sense. The phased approach is reasonable. One should be prepared for an adaptive strategy depending on climate. A certain amount of dredging may be necessary in the most contaminated areas. The use of polyacrylamide (PAM) in stabilizing graded areas (p. 107, Rose 2006) and enhancing flocculation should probably be limited as the introduction of chemicals in the environment should be avoided if possible.

Response #42

Comment noted. The proposed implementation plan includes a task to evaluate the feasibility and to investigate mechanisms for ensuring funding for future dredging operations in the watershed (for a description of this task, see page 93, Section 8.3.6 of the November 17, 2006 OCs TMDLs technical report).

Comment #43

As the phased process of TMDL implementation continues, the Santa Ana Regional Water Quality Board should pay attention to the advice from the public following the June 2005 CEQA scoping meeting listed on p. 114 in Rose (2006). Some of the points raised were that future meetings should be properly noticed, that there should be appropriate coordination with other California agencies such as the Department of Fish and Game, and that some facts are encouraging despite the OC contamination, for example that the population of endangered bird species such as the clapper rail population has doubled in a relatively short period.

Response #43

Comment noted. Public participation is and has been an important part of the TMDL/Basin Plan amendment process and any errors in noticing are inadvertent and rare. The need for consultation with other resources agencies, including the Department of Fish and Game, is well recognized and is an important part of consideration of these and other TMDLs/Basin Plan amendments. Encouraging information is welcomed and hopefully will be reflected in future TMDL decisions, including possible delisting of one or more of the organochlorine compounds from the 303(d) list of impaired waters.

Regional Board staff has developed a Substitute Environmental Document (SED) to address the CEQA issues that have been raised by the public and as required under the Arcadia decision (*City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392). The SED will be re-circulated for additional public comments 45 days prior to the adoption hearing for the organochlorine compounds TMDLs.

**Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Commenter/Agency	Page Numbers	Comment Numbers
G. Scott McGowan, Chief Environmental Engineer, Division of Environmental Analysis California Department of Transportation Letter dated January 9, 2007	2-4	1-3
Alexis Strauss, Director - Water Division U.S. Environmental Protection Agency, Region IX Letter dated January 11, 2007	4-5	4-8
Karen Goebel, Assistant Field Supervisor Ecological Services U.S. Fish and Wildlife Service, Carlsbad, CA Office Letter dated February 28, 2007	5-14	9-30
Darren Newton, Environmental Coordinator Base Realignment and Closure Program (BRAC) Management Office West U.S. Department of the Navy Letter dated March 1, 2007	14-18	31-37

**Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

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**G. Scott McGowan, California Department of Transportation**

Comment #1

The Department commends the Regional Board for using multiple lines of evidence to determine whether impairment does exist, and for developing total maximum daily loads (TMDLs) to address only those specific impairments.

Response #1

Comment noted and appreciated.

Comment #2

The Department is concerned with the low numeric targets. For example, the numeric target of 0.1 µg/kg for toxaphene in San Diego Creek is far below current laboratory detection limits. We are also concerned that we may not be able to demonstrate compliance and may therefore be subject to enforcement actions or third party lawsuits.

Response #2

To implement the proposed TMDLs, if approved, the Board will need to establish appropriate permit limitations and other regulatory requirements based on the wasteload allocations, load allocations and implementation requirements identified in the proposed implementation plan. Discharger compliance will rely on compliance with those permit limits and other regulatory requirements, not on compliance with the numeric targets. The numeric targets and other aspects of the TMDLs, including the wasteload and load allocations and implementation requirements, are subject to review and revision as additional data are collected and evaluated.

In general, analytical laboratories are very responsive to the need to lower method detection limits when regulatory limits require detections of compounds at lower and lower concentrations (e.g., laboratories can now routinely detect selenium at concentrations lower than the CTR chronic freshwater criterion of 5 µg/L).

EPA's Office of the Inspector General (OIG) has determined that the current approved EPA methods (in particular, EPA Method 8081) for measuring toxaphene once it has been released to the environment are not adequate (<http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007.pdf>). In the environment, the original toxaphene mixture ("technical toxaphene"), which is composed of several hundred compounds, degrades and the components lose chlorines (dechlorination). The degradation products appear different to the testing instruments than the technical toxaphene mixture as a result of the dechlorination process (EPA OIG Report No. 2006-P-00007). However, since the analytical standard is based on technical (non-degraded) toxaphene, it may not detect all of the degradation products.

EPA's Office of the Inspector General (OIG) is recommending that toxaphene be analyzed using a new analytical method that combines a gas chromatograph with electron capture detector (GC/ECD) with a negative ion mass spectroscopy (NIMS) to test for toxaphene

## ***Attachment C4 - Response to State and Federal Agency Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

degradation products in environmental samples (EPA OIG Report No. 2006-P-00007). The NIMS method provides definitive test results because the technique generates a mass spectrum for each compound in an environmental sample, providing a “chemical fingerprint” of the degradation products. While the toxaphene sediment numeric target of 0.1 ppb will be at the low end of the detection range for this new method (K. Maruya, SCCWRP e-mail dated August 8, 2007: Attachment I), the NIMS method can definitively determine whether or not toxaphene degradation products are present (EPA OIG Report No. 2006-P-00007). The analytical cost per sample using NIMS may initially be higher than the current analytical methods, but the cost per sample should come down as the method is more widely accepted and used.

EPA Method 8270 is also not a very sensitive method for toxaphene analysis (Rich Gossett, CRG Marine, electronic mail dated August 9, 2007; Attachment I). Toxaphene is a mixture of several hundred compounds; however, EPA Method 8270 estimates the mass of each component in toxaphene to be a nominal 1/200th of the solution concentration for each congener peak. Toxaphene also fragments easily and much of the signal can be lost during analysis. Another method currently being used to detect total toxaphene in sediment and fish tissue, which overcomes some of these limitations, is Negative Ion Chemical Ionization (NICI or NICI) gas chromatograph mass spectrometer (GCMS). This method is equivalent to using an electron capture detector (ECD) but is more efficient (Rich Gossett, CRG Marine, e-mail dated August 9, 2007; Attachment I). In the NICI method, methane is injected into the system and “softly” ionizes the toxaphene molecules instead of breaking them up into many fragments. The GCMS is then used to measure the negative ions. Because only molecules with halogens like chlorine or bromine are detected, this method results in a much cleaner signal and lower background noise which means lower detection limits. The use of NICI is allowed as part of EPA method 8270 and can detect toxaphene at concentrations below the TMDL numeric target for sediment of 0.1 ppb (Rich Gossett, CRG Marine, e-mail dated August 9, 2007; Attachment I). The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis.

### Comment #3

The Department owns approximately 70 miles of highway, two maintenance stations, and three park-and-ride facilities within the watershed. The Department has never used DDT, Chlordane, toxaphene or PCBs within the right-of-way. The only potential for these pesticide discharges from the Department right-of-way would be from disturbance of soils that were previously used for agricultural purposes. The Department will continue to use construction site BMPs to minimize erosion and control discharges of sediment from our facilities.

### Response #3

Regional Board staff recommends that if activities associated with CalTrans highways, stations or facilities may potentially disturb soils that were previously used for agriculture; the Department should implement a program to test the soils for the presence of OC pesticides, prior to the start of grading activities or construction. The testing plan should ensure that an appropriate number of samples are collected for the size of the project and that the samples are submitted to a laboratory that uses analytical methods with low

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

enough detection limits for comparison to the TMDL sediment numeric targets. If soils contaminated with OC pollutants are found, the Department should either remove the contaminated soils or take the appropriate steps to ensure that their erosion and sedimentation control BMPs will prevent the discharge of OC pollutants associated with fine sediments from leaving the site.

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***Alexis Strauss, U.S. EPA Region IX***

Comment #4

The proposed TMDLs meet all regulatory requirements and will be approvable upon submittal to EPA. We find these TMDLs provide reasonable technical analysis using the available data, information and scientific tools. The selected numeric targets are appropriate and have been widely used in California to address impacts from bioaccumulative toxic pollutants. Regional Board staff has modified the technical approach to integrate toxic pollutant loads with the existing sediment TMDL loads, which results in small pollutant loading capacities for each waterbody.

Response #4

Comment noted.

Comment #5

These TMDLs address the specific water body-pollutant combinations as identified on California's 2004-2006 303(d) list for San Diego Creek/Newport Bay watershed, as approved by EPA on November 30, 2006. Regional Board staff have also proposed to delist certain toxic pollutants from these waters. EPA generally concurs with the assessment findings and supporting information to delist certain toxic pollutants, although we have yet to make a final determination on these findings. We anticipate taking further action on the State's decisions for not including waters and/or pollutants on the 303(d) list next month.

Response #5

Comment noted.

Comment #6

Once these TMDLs are finalized and adopted by State procedures and subsequently receive EPA approval, the TMDLs will supersede the EPA-established TMDLs for corresponding water body-pollutant combinations. Any EPA-established TMDL will remain in effect unless it is included in the proposed Organochlorine TMDLs or the appropriate delisting is approved. Thus, EPA-established TMDLs for chlordane, dieldrin and PCBs in San Diego Creek will remain in effect and need to be incorporated into NPDES permits.

Response #6

Comment noted. Regional Board staff will incorporate requirements to implement EPA's established TMDLs into NPDES permits and other waste discharge requirements as necessary, unless delisting of a particular contaminant is approved before the permit is revised or issued.

**Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

**Comment #7**

We endorse the proposed TMDL implementation plan, which identifies reasonable pollutant reduction measures and takes an adaptive management approach to reviewing and, if necessary, revising the TMDLs, allocations, and/or implementation actions based on future data and information. State-adopted TMDLs have more regulatory effect upon remediation projects at EPA Superfund sites such as El Toro Marine Base, as the State-adopted TMDLs may provide mandatory clean-up levels, and EPA-established TMDLs do not have the same requirements. This could influence the implementation goals.

**Response #7**

Regional Board staff have reviewed the clean-up levels used at MCAS Tustin and El Toro and have notified the current property owners that (1) effective BMPs must be employed to prevent the erosion and off-site transport of soils that may contain pollutants of ecological significance to surface waters, and (2) that some of the soils on these sites may require further remediation to ensure that construction and post-construction activities do not result in the erosion and transport of ecologically significant contaminated soils to surface waters. Many of the contaminated sites on these two former military bases were remediated to preliminary remediation goals (PRGs). As the commenter is aware, PRGs are several orders of magnitude higher than the proposed OCs TMDLs sediment numeric targets. Therefore, there is an essential need for implementation of comprehensive, highly effective erosion and sediment control measures in areas where contaminated soils have been identified, even if they have been remediated to PRGs. The OCs TMDLs implementation plan will require that effective sediment and erosion control BMPs are deployed at these sites in order to assure proper control of OCs loads that may result from post-closure activities. The City of Tustin and Great Park Corp/Heritage Fields LLC, which are engaged in or will oversee redevelopment of MCAS Tustin and MCAS El Toro have committed to the implementation of effective erosion and sediment control measures at these sites.

**Comment #8**

We urge the Regional Board to adopt these TMDLs, consistent with the State's commitment to submit final TMDLs for these waters for EPA approval by 2007. Over the past two years, the Santa Ana Regional Board has struggled to maintain pace with its TMDL commitments; the development of final Organochlorine TMDLs has been repeatedly delayed.

**Response #8**

Comment noted. These TMDLs have been controversial and Regional Board staff has made every effort to work with USEPA staff and the stakeholders to ensure that these TMDLs are completed before the end of the year. The OCs TMDLs public adoption hearing has been scheduled for September 7, 2007.

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***Karen Goebel, U.S. Fish and Wildlife Service***

**Comment #9**

The list of threatened and endangered species present in the Newport watershed is incomplete. Currently, the federally threatened and endangered species occurring in the

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

San Diego Creek watershed and Newport Bay include: (a) five species that forage or live in contact with aquatic environments. Those species are the brown pelican, California least tern, light-footed clapper rail, western snowy plover and the plant, salt marsh bird's beak; (b) two species that live in close proximity, but not directly dependent on aquatic habitat are the least Bell's vireo and coastal California gnatcatcher. The State endangered Belding's savannah sparrow forages and lives in close contact with the aquatic environment. The staff report indicates that the State endangered peregrine falcon is present and may be linked through diet to the aquatic system.

Response #9

Comment noted.

Comment #10

The concentrations of organochlorine compounds in sediment and fish tissue used as benchmarks in the staff report to assess impairment may not be protective of wildlife. The sediment benchmarks pertain to directly exposed benthic invertebrates, and are concentrations above which either adverse effects are probable or harmful effects on sediment-dwelling organisms are expected to occur frequently. The sediment benchmarks do not address bioaccumulation because they do not address risks to upper trophic level species. The 1972 NAS fish tissue guidelines for wildlife are well above those considered in more recent criteria, such as by USEPA.

Response #10

Board staff's impairment assessment used the Effects Range Median (ERM) concentration (which is recommended by the State Board's 303(d) Listing Policy). An ERM is the 50th percentile on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect (O'Conner, 2004). The ERM is interpreted as the point above which adverse effects are expected. However, as the commenter is aware (Comment #22), the sediment numeric targets (TEs) used to calculate the TMDLs are set at levels below which no, or only low, adverse effects are expected. Thus, the proposed targets/TMDLs are expected to protect beneficial uses.

The linkage between adverse effects in sensitive wildlife species and concentrations of the OC pollutants in sediments, prey organisms and water is not well understood at the present time, although work is underway to better understand ecological risk in Newport Bay. In addition, the State is in the process of developing sediment quality objectives that should provide guidance for assessing adverse effects due to pollutant bioaccumulation. Reducing contaminant loads in the sediment will result in progress toward reducing risk to aquatic life and wildlife. During the implementation of these TMDLs, additional and/or modified wildlife or other targets may be identified as risk assessment information becomes available. The TMDLs will be revisited and revised as appropriate.

Comment #11

We evaluated the data on the contaminants of concern (toxaphene, chlordane, PCBs, and total DDT (DDT and its metabolites) and their concentrations in forage fish and benthic invertebrates presented in the staff report to determine if the conclusions about impairment would be different if risk-based dietary screening levels for small and medium-size birds

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

were also considered. Screening levels are contaminant concentrations below which there are no further concern, and above which the contaminant may require further consideration. Decisions based on these conservative values help to support the recovery of threatened or endangered species. They help prevent impacts on other sensitive species that rely on habitats and food supply in San Diego Creek and Newport Bay. The screening levels specific to small and medium-size birds that were used are based on readily available Toxicity Reference Values (TRVs), combined with peer-reviewed exposure factors from 1993 USEPA guidance and primary literature (Nagy 2001), however, no readily available TRV could be located for toxaphene. USEPA-Biological Technical Assistance Group TRVs are peer-reviewed values used for total DDTs and total PCBs. The results of our analysis are generally consistent with conclusions in the staff report, with additional comments.

Response #11

Comment noted.

Comment #12

We encourage you to improve the data base on COC [contaminants of concern] levels in fish from San Diego Creek and tributaries.

Response #12

Several studies are currently underway that should improve the current information on contaminant concentrations in fish in San Diego Creek and its tributaries. These studies include a tissue trend monitoring program, similar to the State Mussel Watch and Toxic Substances Monitoring programs, being implemented by the California Department of Fish and Game (CDFG) and a bird egg tissue study (being implemented by the Southern California Coastal Water Research Project (SCCWRP) and CH2MHill) that is also collecting fish and other bird food items to determine contaminant concentrations and pathways for birds that may be at risk from bioaccumulative contaminants in both the fresh and saltwater areas of the watershed.

Comment #13

We did not evaluate risks posed by COCs [contaminants of concern] in San Diego Creek to birds that rely on benthic invertebrates for food due to a lack of such data. Staff were limited by time to evaluate other more generic approaches to establishing risk.

Response #13

Comment noted.

Comment #14

We agree that removing DDT<sub>r</sub> from the list of impairments for San Diego Creek and tributaries is premature since the maximum DDT<sub>r</sub> concentrations in forage fish from San Diego Creek and one tributary exceed dietary levels of concern for avian species that rely on forage fish for food. Since the data is limited, additional sampling is recommended.

Response #14

See Response #12.



***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #15

PCBs are present in San Diego Creek and tributaries forage fish and accumulating in food web organisms but are not exceeding dietary levels of concern for wildlife. While the risk is low, the risk of PCBs in the presence of other OCs is uncertain. Given the limited data, we agree that an informational TMDL for PCBs in San Diego Creek would be appropriate, and additional sampling is encouraged.

Response #15

Comment noted. Also, please see Response #12.

Comment #16

We evaluated data from Sutula et al (2005) on COC concentrations in biota from Newport Bay. They indicate that DDT<sub>r</sub> is available and accumulating in benthic invertebrate tissue, the maximum reported concentration exceeding the dietary levels of concern for both biota and benthic invertebrates, and small and medium-size avian species, and the median concentration for crabs and isopods approach levels of concern for small birds. The study of COC concentrations in bird eggs by Sutula, with the finding that one out of the six eggs had much higher DDT<sub>r</sub> and PCB concentrations and a thinner shell. The DDT<sub>r</sub> data is sufficient to suggest there may be impacts, and that exposure to DDT<sub>r</sub> alone may be increased by the presence of PCBs and chlordane that were also detected in clapper rail eggs. We support the conclusion that TMDLs are warranted for DDT<sub>r</sub>, PCBs and chlordane in Newport Bay. We recommend that risk to species that consume benthic invertebrates be considered when establishing the TMDLs to address our concerns. Species that consume benthic invertebrates comprise a receptor group that includes the federally threatened western snowy plover and the federally endangered light-footed clapper rail.

Response #16

Regional Board staff is aware of FWS staff's concerns regarding birds that may be at risk from OC pollutants in the watershed and have initiated several studies that should help to better define the potential impacts to sensitive species from these contaminants. Threshold Effects Levels (TELs) were selected as conservative TMDL sediment numeric targets that are expected to provide protection to benthic organisms, fish and the birds that prey on them. However, due to concerns expressed by stakeholders and FWS that the current numeric targets are either overly conservative or not sufficiently protective, an Independent Advisory Panel (IAP) of qualified, scientific experts will be convened to assess and revise, if necessary, the TMDL numeric targets. In addition, a study currently being conducted by the San Francisco Estuary Institute (SFEI) as part of the State's Sediment Quality Objective (SQO) effort, is expected to provide a methodology that will assist in evaluating indirect adverse effects for bioaccumulative pollutants in Newport Bay.

Comment #17

Available data indicates that although chlordane and PCBs were not detected in benthic invertebrates, these chemicals were detected in clapper rail eggs. Therefore, in addition to DDT<sub>r</sub>, chlordane and PCBs are present and accumulating in the food web of species that consume benthic invertebrates from Newport Bay, and we recommend that this be reflected in the staff report.

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #17

Section 2.4.2 in the November 17, 2006 OCs TMDLs technical report (pages 26-27) discusses the findings of the Sutula report (SCCWPR Technical Report 467, 2005) and acknowledges the fact that organochlorine pollutants are bioaccumulating and biomagnifying in the food web of the light-footed clapper rail.

Comment #18

The lack of data on toxaphene in fish from Newport Bay did not support a determination of current impairment in Newport Bay. Given that San Diego Creek and a tributary were determined to be impaired for toxaphene in fish tissue, we recommend that additional sampling be considered to improve the data base on toxaphene in fish from Newport Bay. In addition, we recommend that efforts be undertaken to identify wildlife risk-based benchmarks for toxaphene that can be used to evaluate risks posed by toxaphene levels detected in avian prey, in order to determine if a TMDL for toxaphene in Newport Bay is warranted.

Response #18

See Response #12. The OCs TMDLs implementation plan includes a task (Attachment 2 to Resolution No. R8-2007-0024, Task 9 [4]) to improve the linkage between toxaphene measured in fish tissue and bed sediments. Improvements in analytical methods for toxaphene (see discussion under Response #2) should allow for lower detection limits in both fish tissue and sediment so that contaminant concentrations can be better correlated. However, given the complexity of toxaphene (it is composed of several hundred different compounds) and its many degradation products, it may be difficult to establish wildlife risk-based benchmarks that can be used to evaluate risks posed by toxaphene levels detected in avian prey. Regional Board staff would appreciate any input from FWS staff on how best to proceed with this task. The IAP, which will likely be established during implementation of the OCs TMDLs, may also be able to provide recommendations on how to assess the potential risk toxaphene may pose to birds and fish in the watershed.

Comment #19

We support Regional Board staff's determination that TMDLs for DDT<sub>r</sub> are warranted in Newport Bay. Chlordane was present at measurable levels in Newport Bay forage fish but below dietary levels of concern for piscivorous birds. However, maximum and mean concentrations of DDT<sub>r</sub> exceed dietary levels of concern for both small and medium-size piscivores.

Response #19

Comment noted.

Comment #20

The frequency of detection of PCBs was low and detectable levels did not exceed dietary levels of concern for piscivorous birds. Whether PCBs are present at levels that may be of concern when other OCs are present was not determined.

Response #20

Comment noted.

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #21

We recommend that numeric targets for COCs in fish tissue, sediment and water in San Diego Creek and Newport Bay be derived with the sensitive and potentially most exposed receptors, the small and medium-size birds, in mind. (See comment #3) In doing so, the subsequently derived TMDLs will help to support the recovery of threatened or endangered species as well as prevent impacts to other sensitive species that rely on habitats and food supply offered by San Diego Creek and Newport Bay.

Response #21

See Response #16.

Comment #22

The Board's recommended numeric targets for sediment are low-threshold guidelines for benthic invertebrates in freshwater and estuarine/marine systems. We advise that guidelines based on risks posed by bioaccumulative compounds to benthic invertebrates are not necessarily protective of wildlife that rely on benthic invertebrates or fish for food. Wildlife risk-based targets may be computed from thresholds for avian diets combined with site-specific biota-sediment accumulation factors (BSAFs). BSAFs require data on contaminated levels in biota and co-located sediment. DDT<sub>r</sub> is the only contaminant with adequate data to compute BSAFs in Newport Bay.

We used BSAFs from Sutula et al. (2005) to back calculate from dietary screening levels for birds that consume benthic invertebrates to sediment screening levels to evaluate the staff report's recommended numeric target for DDT<sub>r</sub> in sediment. Data were not normalized for organic carbon content. Based on our calculations, the BSAFs translate into sediment screening levels for DDT<sub>r</sub> that range from approximately 2.0 ppb dry weight to 13 ppb dry weight for small birds (e.g. plovers) and from approximately 3.0 ppb to 20 ppb dry weight for medium-size birds (e.g. clapper rails). Calculations are based on data collected from only five locations in Upper Newport Bay. To be conservative, we recommend that the low-end values be considered, at least initially. It may be desirable to develop a more robust data set to better quantify the relationship between DDT concentrations in sediment and those in the tissues of co-located invertebrates. Ideally, similar data would be collected on the other COCs as well, particularly the PCBs.

Response #22

See Responses #12 and 16. The DDT<sub>r</sub> sediment screening values derived by FWS staff are only marginally lower than the proposed TMDL marine sediment numeric target of 3.89 ppb. The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets, loads and allocations as new information becomes available.

Comment #23

Forage fish-sediment BSAFs can be used to derive tentative sediment guidelines protective of wildlife whose diets consist of forage fish. We computed BSAFs for forage fish by pairing data from Allen et al. (2004) on DDT<sub>r</sub> concentrations in forage fish from Newport Bay with data from Sutula et al. (2005) and Bay et al. (2004) on DDT<sub>r</sub> concentrations measured in sediments. The years that sediment data was collected are comparable to when fish samples were collected, allowing rough estimates of BSAFs. Median DDT<sub>r</sub>

## ***Attachment C4 - Response to State and Federal Agency Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

sediment concentrations for Upper Newport Bay (approx. 13 ppb) and Lower Newport Bay (approx. 16 ppb) were used to reflect the assumption that fish are exposed to sediment from locations throughout the waterbody where they are captured. Data were not normalized for organic carbon content, and DDT<sub>r</sub> fish concentrations were converted from wet weight values to dry weight values (assume 80% moisture) before BSAFs were calculated.

Based on this analysis, the forage fish-sediment BSAFs for Upper and Lower Newport Bay, combined, range from 32 to 102. The BSAFs translate into sediment screening levels for DDT<sub>r</sub> ranging from approximately 0.4 ppb to 2.5 ppb dry weight based on risks to small avian species and approximately 1.3 ppb to 8.5 ppb dry weight for medium-size avian species that consume forage fish from Newport Bay. Both ends of the risk-based sediment values are near the low-threshold guidance in the staff report, Table 3-1 for protection of the benthic invertebrate community in Newport Bay. It may be desirable to develop a more robust data set to better quantify the relationship between DDT concentrations in sediment and those in the tissues of co-located invertebrates. Ideally, similar data would be collected on the other COCs as well, particularly the PCBs.

### Response #23

Comment acknowledged. Please also see Responses #12, 16 and 22.

### Comment #24

The 1972 NAS guidelines proposed as the numeric fish tissue targets for aquatic life and wildlife were compared against the conservative risk-based values (see Comment 3) to determine if the targets may be considered adequately protective of wildlife. Compared against these risk-based screening values, 1) for a small piscivorous bird, a) the proposed DDT<sub>r</sub> numeric target is under-protective by a large margin; b) DDT<sub>r</sub> in Newport Bay is potentially under-protective; c) chlordane in both San Diego Creek and Newport Bay are protective to over-protective, respectively; and, d) PCBs in San Diego Creek are potentially under-protective. Recognizing that risk-based screening levels are intentionally conservative, the differences between the risk-based screening levels and the proposed targets were identified as “potentially” over- or under-protective. The target proposed for DDT<sub>r</sub> in fish from San Diego Creek is definitely higher than desired. We recommend reevaluation of the fish tissue benchmark for DDT<sub>r</sub> in freshwater fish, and perhaps others used in the staff report. We also recommend the process includes coordination with other agencies and peer review, particularly if the conclusions are used to develop criteria.

### Response #24

The revised Basin Plan Amendment (BPA) provides the opportunity for development of a comprehensive work plan for the watershed that will address OC pollutants as well as other potential sources of toxicity in the watershed. The work plan approach, if pursued by the stakeholders, would include an early task to establish an Independent Advisory Panel (IAP) of objective, qualified scientists who will help to evaluate and address areas of remaining uncertainty in the OCs TMDLs—and in particular, the issue of suitable TMDL numeric targets—and provide guidance and recommendations on the prioritization and appropriateness of the TMDL implementation tasks. Further, ongoing investigations (see Response # 12 and special studies recommended in the proposed implementation plan

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

(Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 9 (2 and 4) should provide data that will assist with refinement of the numeric targets.

Comment #25

The staff report indicates that State endangered peregrine falcons are present. Peregrine falcons are predators of avian species that consume fish and benthic invertebrates. As such, peregrine falcons (and bald eagles) are potentially an aquatic-dependent species that occupies a higher trophic level any of the other receptors considered in the staff report when target OC concentrations for water, sediment or fish tissue were selected. Since relevant body burden or biomagnification data on the risks to falcons and eagles is not available, it may not be feasible to determine if the target concentrations proposed for OCs in fish tissue, water and sediment would protect these high trophic level receptors. At a minimum, we recommend that the report acknowledge that target concentrations for OCs in fish, water and sediment derived to protect piscivorous birds might not be protective of their predators.

Response #25

While changes to the November 17, 2006 OCs TMDLs technical staff report are not being made as a matter of procedure (this report was not issued as a draft); the information provided by the commenters on the recommended TMDLs will be included in the administrative record for the TMDLs. Though the issue raised in Comment #25 was not specifically addressed in the OCs TMDLs technical report, it is acknowledged that additional wildlife targets will be identified during implementation as more risk assessment information becomes available. The phased nature of the OCs TMDLs will allow for revision and refinement of the targets and the determination of impairment as needed. An assessment of the potential risk posed to avian predators of piscivorous birds could be added to the list of implementation tasks as work to implement and refine the TMDLs proceeds.

Comment #26

In Section 4.1.2 (of the staff report), please note that population decline is an adverse effect in birds that has been associated with DDT exposure. In addition, the effect level given for DDT<sub>r</sub> (primarily DDE) in pelican eggs (3.0 µg/g or 3.000 ppb wet weight) is a benchmark associated with a severe effect.

Response #26

While we do not propose to change the November 17, 2006 OCs TMDLs technical report (see Response #25), we can ensure that this issue is made part of the administrative record for the TMDLs and is addressed during their implementation. In addition, this information has been used in responding to comments from Dr. James Byard and Flow Science re their proposed alternative numeric targets for DDT in wildlife (see Attachment C1).

Comment #27

There is no discussion of eco-toxic effects of PCBs in the staff report. At a minimum, we recommend that the following points be noted:

#### ***Attachment C4 - Response to State and Federal Agency Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

- PCB exposure is associated with reduced hatching success and mortality of early life stages in fish.
- In avian species, PCB exposure has been related to reproductive impairment primarily due to reduced hatching success and increased embryo mortality and deformities. Neurotoxicity leading to behavior impairments occurs when adults are exposed.
- PCB exposure has been related to neurotoxicity and reproductive impairment in sensitive mammal species as well.

##### Response #27

While we do not propose to change the November 17, 2006 OCs TMDLs technical report (see Response #25), we can ensure that this issue is made part of the administrative record for the TMDLs and is addressed during their implementation.

##### Comment #28

The impacts of ACOE [US Army Corps of Engineers] restoration projects on future sediment deposition patterns and/or spatial distribution of COCs may be significant, depending upon the COC concentrations in older sub-surface sediments that are re-suspended during restoration project implementation. We recommend that the potential suspension and redistribution of contaminated sediment be considered when planning such projects. Pre-project sampling and analysis of sediments in the project area and migration monitoring during project implementation is ideal.

##### Response #28

Comment noted. The Regional Board issued Waste Discharge Requirements (WDRs) to the USACOE for the Lower Newport Bay dredging project. The WDRs required post-project monitoring to address changes in contaminant concentrations in sediments in the dredged areas. However, a review of our in-house files does not indicate that the USACOE either acknowledged or implemented the requested monitoring. To our knowledge, the USACOE is not conducting monitoring for the OCs as part of the Upper Newport Bay Restoration Project dredging, though Regional Board staff issued a Clean Water Act Section 401 Water Quality Standards certification for the proposed dredging that included post-dredge sediment monitoring requirements for OC pollutants and metals (Regional Board staff letter dated August 9, 2004, to Larry Smith, USACOE Project Environmental Coordinator).

Currently, the State is funding a trend monitoring program that entails collection of sediment, water column and fish tissue samples from Newport Bay. Samples will be analyzed for several bioaccumulative contaminants, including organochlorine compounds. Samples have been collected prior to and during the Upper Newport Bay dredging activities. Funding through the 2007-2008 fiscal year has been obtained and Regional Board staff supports the continued implementation of this monitoring program. Data from this study should help to identify whether or not dredging operations have resulted in increased bioavailability of organochlorine pollutants. For future dredging projects in the bay, Regional Board staff will work with local agencies and stakeholder groups to identify appropriate monitoring and the Regional Board will require such monitoring in waste discharge requirements/water quality certifications for these projects.

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #29

The implementation plan identifies actions to accelerate the decline of OC concentrations in the watershed and to augment natural attenuation. Natural attenuation assumes that over time older more contaminated sediments will be covered by newer, cleaner sediment. Newport Bay sediments may be disturbed during implementation of USACOE planned restoration projects and hinder natural attenuation by dredging activities. The importance of efforts to reduce inputs of OCs from upstream sources is increased to ensure effective natural attenuation.

Response #29

Comment noted. Regional Board staff is aware of the potential impacts that may result from dredging operations in Newport Bay (see Response #28). The implementation plan is aimed at identifying actions to accelerate the decline in OCs concentrations in the watershed and to augment their natural attenuation; it does not rely on one solution, such as dredging, to reduce OC pollutant loads in the bay. The implementation plan includes several tasks that are intended to continue to reduce OCs pollutant loads from upstream sources.

Comment #30

The Implementation Plan sites numerous references to stakeholder development of other benchmarks to determine fish tissue, sediment and water impairment for the COCs, and as targets for setting TMDLs. Alternative benchmarks may be warranted to adequately address risks posed by COCs to fish and wildlife. Such endeavors are best conducted through a process that includes collaboration with other agencies and peer review.

Response #30

Comment noted. An Independent Advisory Panel (IAP) of objective, qualified scientists is expected to be established during implementation to help evaluate and address areas of remaining uncertainty in the OCs TMDLs — and in particular, the issue of suitable TMDL numeric targets or benchmarks — and provide guidance and recommendations on the prioritization and appropriateness of the TMDL implementation tasks.

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***Darren Newton, U.S. Department of the Navy***

Comment #31

The draft Staff TMDL Report inaccurately highlights Former Marine Corps Air Station (MCAS) El Toro and former MCAS Tustin as potentially significant contributing sources of OCs within the San Diego Creek watershed. The source discussion in Section 4 is biased by presenting only readily available/obtainable data from environmental restoration activities at the two former MCAS. The assertion that the two MCAS may be significant sources of OCS is not consistent with the findings of impairment presented in Section 2.4.4 of the draft Staff TMDL Report. The report does not provide a technically defensible link between the DDT in Peters Canyon and discharges from former MCAS Tustin. A more thorough quantitative analysis is warranted of all point sources.

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #31**

As reflected in the November 17, 2006 organochlorine compounds TMDL technical report (the “draft Staff TMDL Report” identified in the comments) and in the proposed TMDLs implementation plan, Board staff agrees that a more thorough analysis of sources of OCs is needed. The discussion in Section 4.0 of the TMDL Report explicitly acknowledges that the discussion of sources is primarily qualitative, given that there are no records of historic pesticide applications and that all sources of OCs are related to historic applications (see p.44, 4.1.2, first paragraph and p. 50, 4.2, first paragraph). The intent of the source analysis is not to highlight or bias the discussion, nor to suggest that OCs discharges from the two former MCAS are necessarily the cause of impairment in receiving waters affected by these discharges. Rather, the TMDL reports on relevant and available data and information that is then used to identify appropriate implementation activities. The proposed implementation plan includes several tasks (see Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Tasks #2, 3, 5, 9 (#5)) that entail additional source investigation, and follow-up actions where found necessary. It should be noted that Task 5 in the proposed TMDL Implementation Plan has been modified (to specify that if the results of source evaluations indicate that additional OCs soil remediation is necessary on MCAS Tustin and MCAS El Toro, the responsible parties for such remediation will be identified. The responsible party will be tasked to implement those portions of the BMP plan identified for the responsible party for MCAS Tustin and MCAS El Toro. The proposed implementation plan also recognizes that review and, possibly, revision of the TMDLs will be necessary based on the results of these and other implementation tasks (see Task 10, Phase II Implementation).

**Comment #32**

Given the ubiquitous distribution of PCBs in the environment that resulted from a wide number of historical uses, it is inappropriate to identify the two Former MCAS as the “likely” sources of watershed loadings. The draft Staff TMDL Report indicates that estimated existing loadings of PCBs in San Diego Creek are approximately an order of magnitude less than the loading capacity; this suggests that ongoing loadings are associated with low-level non-point loadings throughout the watershed rather than from historical spills. The draft Staff TMDL Report did not reach a conclusion of impairment for PCBs. Installation Restoration Program (IRP) sites with PCBs or OCs pesticides in soil at the two Former MCAS encompass an extremely small area compared to the very large area of the San Diego Creek and Newport Bay watersheds. Incremental loadings of PCBs or OC pesticides from these sites are likely significantly less than loadings contributed by other land uses (e.g., nurseries, agriculture).

The Navy disagrees with the suggestions in the draft Staff TMDL Report that residual levels of pesticides and PCBs at IRP sites represent a substantial threat to water quality in San Diego Creek and Newport Bay. Given the extensive IRP, the impacts of historical releases and the contaminated media still requiring remediation at the two Former MCAS are well understood.

**Response #32**

Regional Board staff believes that the Navy overstates the statements in the November 17, 2006 TMDLs technical report regarding the potential significance of OCs inputs from the



***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

two Former MCAS. As discussed in Response 1, the TMDL technical report acknowledges that the dearth of source data renders the source analysis in Section 4.0 primarily qualitative, and the proposed Implementation Plan is directed to a large extent to source investigation and subsequent follow-up based on the results. Use of the term “likely” in the context of the two Former MCAS is limited to a statement that the levels shown in Table 4-4 of the Technical TMDL Report reflect a reservoir of OCs pollutants that likely exists at these sites and that may become mobilized as the sites are developed. Revised Task 5 of the proposed Implementation Plan recognizes the need to evaluate whether the two former MCAS sites are significant OCs sources and, if so, to identify the party responsible for BMP implementation (see Response 1).

The rationale for the Navy’s suggestion that ongoing loadings are associated with low-level non-point loadings throughout the watershed is not clear.

**Comment #33**

Conceptual models for each of the water bodies included in the draft Staff TMDL Report should be provided to better establish the implicit assumptions about contaminant migration pathways, exposure routes, environmental receptors and beneficial uses.

**Response #33**

Board staff agrees. Please see the revised implementation plan in Section 4.3.b of the proposed Basin Plan Amendment (Attachment 2 to Resolution No. R8-2007-0024, Task 7).

**Comment #34**

The TMDL development approach in the draft Staff TMDL Report relies on various technical uncertainties that significantly affect the scientific credibility of the approach. Data that show declining trends in OCs residues in fish tissue suggest that instituting a watershed monitoring program would be a more prudent approach to addressing the concern associated with potential legacy contamination within the watershed. Such a monitoring program would provide invaluable information necessary to establish scientifically defensible TMDLs, if they are in fact necessary. Information on the population status of light-footed clapper rails in the watershed argues against the need for an OC TMDL.

**Response #34**

A phased TMDL approach is recommended in light of recognized uncertainty. As discussed in the TMDL technical report (see page 81, section 8.1), the phased approach provides time to conduct further monitoring and assessment, to develop site-specific risk based models to develop appropriate targets, etc. The results of these studies are expected to provide the technical basis for future modification of the TMDLs, WLAs, LAs, targets and other TMDL elements.

The proposed Implementation Plan recognizes the need for and significance of a watershed monitoring program and special investigations needed to identify sources of OCs in the watershed (see, in particular, Task 8; see also Tasks 1, 2, 3, 5, 7 and 9.)

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

OCs TMDLs have been promulgated by the U.S. EPA. Absent the adoption of USEPA-approvable organochlorine compounds (OCs) TMDLs by the Regional Board, the OCs TMDLs promulgated by the US EPA would remain in effect and would have to be implemented appropriately. Since the USEPA TMDLs do not include an implementation plan or compliance schedule, there would be no basis for specifying a TMDL compliance schedule in permits issued to implement the TMDLs: compliance would be expected immediately. As discussed in prior responses, revisions to the TMDLs will be considered based on the results of implementation efforts. Monitoring, revisions to numeric targets or other changes may indicate that one or more of the OCs TMDLs is not necessary and could be withdrawn.

Comment #35

The calculations of existing pesticide and PCB loadings are based on sediment load calculations; the functional relationship between contaminant mass and sediment loadings needs to be further described. Assumptions regarding the relationships of OCs concentrations, fish tissue, sediment DDE concentrations and benthic organisms are not supported by adequate data. Watershed-specific data concerning the relative magnitude of resuspension and erosion from unimproved stream channels is necessary prior to implementing these TMDLs.

Response #35

The proposed TMDLs are based on best available data, as required. As discussed in Response #34, a phased TMDL approach is proposed in light of recognized uncertainty, and the proposed Implementation Plan is directed to a large extent to monitoring and investigation intended to address that uncertainty. The proposed Implementation Plan includes Task 3, which requires collection of data needed to determine whether discharges of OCs resulting from erosion in and adjacent to unmodified streams are significant.

Comment #36

The numeric targets employed to support the need for OC TMDLs are of questionable utility. The sediment benchmarks employed relate only indirectly to the beneficial uses identified for watershed waterbodies. The sediment benchmarks are designed to be protective of direct contact exposures by benthic macroinvertebrates rather than a warm water fishery use directly. The indirect nature of the relationship introduces uncertainty about the suitability of the single threshold concentration values. Data that relate meaningful biological response to a significant reduction in beneficial use of the fishery over a range of sediment concentrations do not exist.

Rather than using outdated “NAS” criteria for identifying fish tissue threshold exceedances, a more defensible approach would be to utilize the California Toxics Rule criteria that explicitly consider bioaccumulation hazards.

***Attachment C4 - Response to State and Federal Agency Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #36

Pursuant to federal and state statute and regulation, all beneficial uses of waters must be protected. TMDLs must be established to achieve water quality standards, which include beneficial uses. The beneficial uses identified for the Bay include WILD, RARE, SPWN, MAR and SHEL. These beneficial uses encompass plants and animals that use the Bay, including benthic invertebrates, not simply fish. Protection of higher trophic level predators may not protect all species of lower trophic level biota (e.g., benthic invertebrates) since different organisms have variable sensitivities to contaminants.

Review of the available site-specific data for the OC pollutants, indicated that establishing the TMDLs based on the statewide CTR numeric criteria alone would not be sufficient to protect the designated uses and attain the narrative criteria in the Newport Bay watershed. In order to protect the applicable uses and meet the narrative criteria, the most appropriate approach, for these pollutants in this watershed, was to develop TMDLs designed to meet narrative as well as numeric criteria. Threshold Effects Levels (TELs) were specifically selected as sediment numeric targets for protection of wildlife because they directly link sediment concentrations to biologic effects (see Section 3.4, page 40 of the technical staff report). The NAS guidelines are specifically recommended by the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Both (State Listing Policy). Both Regional Board staff and EPA staff believe that the OCs TMDLs numeric targets will result in the attainment of water quality standards and beneficial uses in the Newport Bay watershed.

Comment and Response #37:

The Department of the Navy provided 8 specific comments regarding identified sections of the November 17, 2006 technical TMDL Report, with critiques of and recommendations for modification of the analyses included in these sections. These specific comments mirror the general comments identified and addressed above. Regional Board staff does not intend to modify the technical Report, nor is there a requirement or need to do so. As discussed in the preceding responses to the Navy's general comments, a phased TMDL approach is recommended to allow time to address uncertainty, including whether and to what extent the two former MCAS are significant sources of OCs inputs to surface waters in the watershed. Future review of these TMDLs, and refinement if necessary, will take into account the results of implementation of the tasks identified in the Implementation Plan, including detailed source investigations and comprehensive monitoring. In light of this and the detailed responses provided above, no additional responses are deemed necessary.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Commenter/Agency	Page Numbers	Comment Numbers
Chris Crompton, Environmental Resources Manager, Resources & Development Management Department, County of Orange Letter and attachments dated January 12, 2007	2-25	1-45
Marty Bryant, Director of Public Works City of Irvine Letter and attachments dated January 10, 2007	25	46
Steve Rosansky, Mayor City of Newport Beach Letter dated April 17, 2007	26	47-48
William A. Huston, City Manager City of Tustin Letter and attachments dated January 18, 2007	27-39	49-64
Chris Crompton, Environmental Resources Manager, Resources & Development Management Department, County of Orange Letter dated August 23, 2007	39-42	65-68
Tim D. Serlet, Director of Public Works City of Tustin Letter and attachments dated January 18, 2007	42-43	49-64

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

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***Chris Crompton, County of Orange***

Comment #1

There are a number of significant technical uncertainties regarding the Draft OC TMDL. Uncertainties have been identified both by Regional Board staff in the Staff Report and by stakeholders through prior presentations and submittals to Regional Board staff. Given these technical uncertainties, RDMD supports the creation of a collaborative program that would seek to address these uncertainties.

Response #1

Comment noted. Revisions to the OCs TMDLs Basin Plan Amendment (BPA) include more emphasis on developing a collaborative, flexible, and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. An Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks.

Comment #2

RDMD and many of the watershed stakeholders are concerned about pursuing just legacy pesticides and not toxicity as a whole for the Newport Bay watershed. Such a program could very conceivably cost many millions of dollars and result in marginal net environmental improvement. Therefore, the collaborative program should be a balance of investigations needed to re-evaluate the TMDL in five years through the explicit re-opener stated in Section 8.3.10 of the Staff Report, and, investigations into toxicity as a whole. Using such an approach should ensure that funds are being efficiently and effectively directed to improving water quality in the Newport Bay watershed.

Response #2

Comment noted. See Response #1 above.

Comment #3

In order for a collaborative program to be successful, there must be flexibility. The implementation plan as currently proposed is extremely prescriptive and would limit the creative solutions that the collaborative effort could develop. The work plan must be able to assess not only the priority of the studies suggested in the proposed implementation plan, but also the need for each of the studies. The development of the Nitrogen and Selenium Management Program (NSMP) work plan is an example of how stakeholders and Regional Board staff worked together to create an effective and detailed work plan that was supported by all parties. A similar approach should be followed to develop a work plan for this TMDL.

Response #3

Comment noted. See Response #1 above.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #4

The implementation plan needs to be refocused. The current approach appears to focus on quantifying each and every potential source of OC compounds, regardless of how significant the potential source may be – or how costly such a study may be. It is recommended the approach focuses first on assessing and identifying impacts, and then evaluating the most significant sources upstream that are causing such impacts. By looking at the watershed as a whole and developing a watershed-wide management plan, it is likely not necessary to quantify every potential source.

Response #4

Comment noted. See Response #1 above. In addition, studies currently underway in the watershed should help to better refine sources of these pollutants and their impacts, as described in Section 8.2 of the November 17, 2006 OCs TMDLs technical report.

Comment #5

The economic analysis in the Draft OC TMDL significantly underestimates the cost of the studies in the proposed implementation plan. The total estimated cost, just for the studies requested of the MS4 Permittees alone, is between \$5,025,000 and \$7,850,000. The implementation plan needs to be refocused in order to ensure that such a significant investment leads to actual water quality improvement. Through the creation of a collaborative program, these studies, in addition to studies examining toxicity as a whole, can be prioritized and evaluated to ensure public funds are used effectively and efficiently.

Response #5

Comment noted. See Response #1 above. Regional Board staff requested additional input from the stakeholders regarding the economic implications of the OCs TMDLs at the December 1, 2006 Public Workshop. Regional Board staff appreciates the County's inclusion of the potential costs associated with some of the TMDLs implementation tasks in their January 12, 2007 comment letter. This information was considered in revising the proposed TMDL BPA. The establishment of a collaborative work plan as now proposed in the BPA and the formation of an IAP (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3. Task 7) will allow Regional Board staff and stakeholders to prioritize and evaluate the proposed implementation tasks, taking economic and other factors into account, so that water quality standards issues can be addressed in the most effective and resource-efficient manner.

Comment #6

Sediment transport into Upper Newport Bay has been characterized by the County of Orange since 1982. While the RMA model was calibrated using County sediment data, the model was last calibrated in 1997. In the past 10 years, the County has collected a tremendous amount of data which shows sediment loads in the watershed are reduced significantly from rates recorded pre-1998, the year the Sediment TMDL was first implemented (see Attachment B, Exhibit 1 – Historical Sediment Load Comparison, San Diego Creek). The figure provided in Exhibit 1 shows the sediment transport curve for San Diego Creek at Campus Drive (the last monitoring station just upstream of Upper Newport Bay). Since 1997-98, the sediment discharge rate into Upper Newport Bay has been decreasing. This information is crucial for the TMDL as loading capacities, waste load and

## ***Attachment C5 – Response to Local Agency/Municipality Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

load allocations, and existing loads are all determined by the amount of sediment transported in the watershed. By using the RMA model without the most recent County monitoring data, all of these calculations are biased too high. Additionally, only using sediment data through 1997 does not account for 10 years worth of sediment and erosion control measures that have been implemented in the watershed through the Sediment TMDL, as well as attenuation that has occurred.

### **Response #6**

The RMA model will be revised and updated to include newer data (including the changed bathymetry in the bay that will result from the dredging operations that have or are taking place in Upper and Lower Newport Bay) and will be run for fine particulates under varying flow conditions to provide better modeling of sediment distribution patterns that are most likely associated with organochlorine compounds (see page 84 of the November 17, 2006 OCs TMDLs technical report). This information can then be used to revise TMDL loading capacities, waste load and load allocations, and existing loads, if necessary.

### **Comment #7**

Per the staff report, in instances where the method detection limit exceeds the selected screening value, data that were non-detect were considered unusable and not considered. The data used in the evaluation are therefore biased entirely only to instances of exceedances. In the instance of chlordane this approach is reasonable (due to method detection limits that are capable of reaching the proposed target). It would nevertheless be extremely useful to include the proportion of data that were included and excluded compared to the complete data set (i.e. if non-detect values are the majority of the data set, then this bias is even more pronounced). In the case of toxaphene, this approach is not reasonable. The selected screening value is a calculated theoretical value that approved EPA standard methods cannot detect. Therefore, it is impossible in the case of toxaphene to ever show compliance with the selected screening value, impossible to ever determine if beneficial uses are protected, and in the case of being promulgated with this TMDL, impossible to ever de-list toxaphene, regardless of the impact of management actions.

### **Response #7**

Appendix B of the November 17, 2006 OCs TMDLs technical report contained the details of the impairment assessment that was conducted for the pollutants and waterbodies of concern in the watershed. The impairment assessment lists the source of the data used in the assessment, the number of samples for each of the media considered, the number of samples that exceeded the screening value, and the number of samples in which the constituent was not detected (“nondetects”). For toxaphene, impairment was based on the exceedance of 4 of 18 fish tissue samples collected by the Toxic Substances Monitoring Program (TSMP) between 1995 and 2001. The toxaphene screening value of 100 ppb (wet weight) used to assess impairment was from the National Academy of Sciences (NAS) 1972 guidelines for protection of wildlife. Sediment samples did not show any detections of toxaphene, so they were not used to determine impairment.

### **Comment #8**

OEHHA screening values are intended to identify a level that warrants additional research to determine *IF* there is a threat to human health from fish consumption. These screening

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

values are not regulatory guidelines and are not intended to be applied as numeric fish tissue standards. Therefore, it is inappropriate to use the OEHHA screening values to determine impairment. Additionally, OEHHA is currently in the process of revising the screening values. Based on the draft revised screening values, no fish tissue samples would exceed the guidelines (i.e., no impairment to human health).

**Response #8**

In the November 17, 2006 OCs TMDLs technical staff report (SARWQCB 2006), OEHHA human health screening values (SVs) were used to assess water quality impairment and also to serve as fish tissue targets for the protection of human health as there are no regulatory numeric criteria for fish tissue. Numeric targets are goals, not standards. To assess whether the narrative toxic substance water quality objective for protection of human health is being achieved, fish fillet concentrations were compared to OEHHA human health risk screening values in the OCs TMDLs impairment assessment. The screening value approach identifies chemical contaminants in fish that occur at concentrations that may be of concern to human health for frequent consumers of sport fish. These values are not meant to be regulatory criteria, but instead are used to reveal where the need exists for further investigation. Consistent with the State Listing Policy, exceedances of OEHHA SVs are being used as thresholds to indicate that contaminants have bioaccumulated in fish tissue to levels that may be of concern to human health and that threaten to violate the narrative toxic substance water quality objective. The use of the OEHHA screening value for interpreting narrative water quality objectives is allowed by section 6.1.3(2) of the State Listing Policy. The issue regarding screening values was addressed during the development of the State Listing Policy.

The State Listing Policy precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft SVs for DDT (560 ppb) because there is no guarantee that draft SVs will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

**Comment #9**

While the National Academy of Sciences (NAS) guidelines from 1972 may be endorsed by the State Water Resources Control Board for use in assessing impairment that does not mean that more appropriate targets do not exist. Science has advanced significantly over the past 35 years resulting in a tremendous amount of research that provides a more appropriate and informed tool to assess impairment. The TMDL should be based on the best available science.

**Response #9**

As discussed in Section 2.3.4, Indirect Toxic Effects, of the November 17, 2006 TMDLs technical staff report, Regional Board staff considered alternative thresholds to use in evaluating impairment for these TMDLs due to criticisms received on the use of NAS guidelines. Concern was raised by some stakeholders that these guidelines are too dated for use and have errors associated with them that should preclude their use. NAS guidelines, however, were ultimately chosen as the preferred thresholds because, in addition to the fact that they have been deemed by the SWRCB to be an appropriate translator for narrative water quality objectives, they also link pollutant concentrations in



***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

tissues to both the protection of aquatic life and predator organisms, and they have been scientifically-based and peer reviewed. Therefore, unless and until the current NAS guidelines are updated, site-specific targets, or more appropriate alternative, scientifically-based and peer reviewed guidelines are developed, the NAS guidelines are considered by staff to be the most defensible for evaluating direct adverse effects to aquatic life, as well as indirect effects to predator organisms through food web biomagnification.

**Comment #10**

The staff report references Figure 2-5 which shows the trend in fish tissue over time (data from the TSMP). Based on the data provided, the projected compliance with fish tissue values in saltwater for DDT will be met by 2007 for protection of aquatic life and by 2003 for protection of human health; for chlordane, compliance was projected in 1992 for protection of aquatic life and wildlife and in 1995 for protection of human health. It appears that natural attenuation will in the very near future, or already has, reduced fish tissue concentrations to acceptable levels.

**Response #10**

Regional Board staff evaluated trends, recognized that they are significant and declining, and recommended that monitoring of natural attenuation be continued. However, the Qualitative Environmental Analysis, Inc. (QEA) memo dated October 3, 2006, which was provided to Flow Science, Inc., and included as Appendix A of their report on DDT (Flow Science, Inc., November 20, 2006; see supplemental staff report Attachment D1), states that “the rate of decline of DDT in the Newport Bay system has slowed over time” with the rate of decline in DDT concentrations in sediment, fish tissue and mussels being greater during the earlier time period reviewed (early 1980s - 1990s). The collection of trend monitoring data (through the State Mussel Watch [SMW] and Toxic Substances Monitoring Program [TSMP]) for the watershed was discontinued by the State in 2001. Beginning in 2006, funding was obtained by Regional Board staff to reinstate trend monitoring in the watershed for at least 3 years. This information will provide data that can be used to determine if the declining trends in the organochlorine compounds are continuing and whether or not concentrations in these media have declined sufficiently to warrant pursuit of delisting for these contaminants.

**Comment #11**

Per Section 2.4 of the staff report, and as calculated based on staff’s data, exceedances of fish tissue targets were not observed for chlordane [in Upper and Lower Newport Bay]. Impairment due to chlordane was determined due to the potential impact to benthic invertebrates which violates the second narrative objective (“the concentration of toxic substances in the water column, sediment, or biota shall not adversely impact beneficial uses”). If fish are protected, then the primary beneficial uses are not impacted.

**Response #11**

It is not clear what is meant by the term “primary” beneficial uses. Pursuant to federal and state statute and regulation, all beneficial uses of waters must be protected. TMDLs must be established to achieve water quality standards, which include beneficial uses. The beneficial uses identified for the Bay include BIOL, EST, WILD, RARE, SPWN, MAR and SHEL. These beneficial uses encompass plants and animals that use the Bay, including

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

benthic invertebrates, not simply fish. Protection of higher trophic level predators may not protect all species of lower trophic level biota (e.g., benthic invertebrates) since different organisms have variable sensitivities to contaminants. For example, as has been seen in the San Diego Creek watershed, concentrations of selenium in fish tissue indicate that fish may be more at risk from selenium reproductive effects than bird predators of fish.

**Comment #12**

The conclusion that DDE was responsible for clapper rail egg thickness in a data set of n=6 is contradicted by the statement that egg thickness was similar to pre-DDT era (pre-1947) clapper rail eggs from a data set of n=80. Caution should be used when determining an impairment based on a data set of 6, and when there is additional evidence that shows the presumptive cause (i.e. DDT) was not present when the same results were found. Therefore, the area of impact to wildlife needs further research before conclusions can be drawn.

**Response #12**

As discussed in pages 26 through 31 of the clapper rail report (Sutula et al., 2005, Organochlorine, Trace Elements and Metal Contaminants in the Food Web of the Light-footed Clapper Rail, Upper Newport Bay, California, Southern California Coastal Watershed Research Project (SCCWRP) Technical Report 467), an analysis of the correlation between 4,4'-DDE concentration and eggshell thickness indicated a significant inverse relationship ( $R^2=0.68$ ,  $p\text{-value}_{\alpha=0.1} = 0.042$ ).

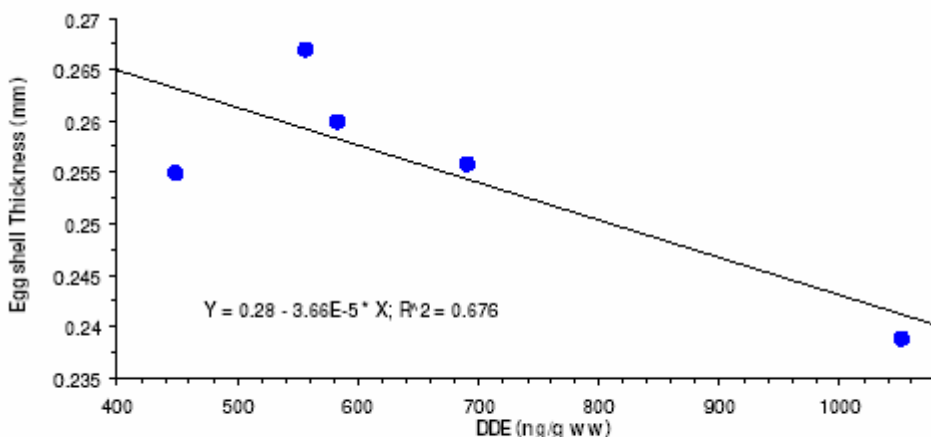


Figure 7. Linear regression between UNB clapper rail eggshell thickness and 4,4'-DDE concentration.

Eggshell thinning has been correlated to DDE residues in a variety of bird species. The mean eggshell thickness measured in the clapper rail eggs collected for the Sutula study (Sutula et al., 2005) was similar to the mean of pre-DDT era (<1947) eggshell thickness measured from 80 eggs in the collection of the Western Foundation of Vertebrate Zoology in Camarillo California. However, physical examination of the eggshells and embryos suggests that 4,4'-DDE could be contributing to the eggshell thinning and developmental abnormalities observed in the egg from Nest Site 5. While the thinning found in the egg from Nest Site 5 may not be biologically significant at the population level, evidence of thinning even at the individual level is important when dealing with endangered species.

## ***Attachment C5 – Response to Local Agency/Municipality Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

### Comment #13

A group of stakeholders have raised questions regarding the science underlying certain targets that have been selected to assess impairment and set waste load and load allocations in the Draft OC TMDL. One potential solution to the debate would be to adopt TMDLs that include ranges of concentrations.

### Response #13

The Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by State Board and USEPA Region 9 staff. In contrast, the assertions made by some stakeholders that the proposed TMDL targets are erroneous and scientifically unjustified are not defensible and are based primarily on the opinion of one commenter, Dr. James Byard, and the Flow Science reports based on his commentaries (see Attachment D), which have not been subject to peer review and scientific validation. In addition, adoption of a range of values for TMDL numeric targets would complicate both establishing effluent limitations and determinations of compliance since the allocations are used as the basis for setting NPDES and other permit requirements. The OCs TMDLs are phased TMDLs and allow for revision and refinement of the loads as new information becomes available. An Independent Advisory Panel (IAP) will be established during implementation of these TMDLs; one of the first tasks of the IAP will be to re-evaluate the TMDL numeric targets.

### Comment #14

On page 33, the Staff Report states, *“...because the OC pollutants are hydrophobic and have low water solubility, existing data showing detectable concentrations of these contaminants are limited. Therefore, CTR water column concentrations were not used as primary targets in these TMDLs.”* This statement is in direct contrast to the selection of a sediment target for toxaphene that is significantly below any detectable limits using EPA approved analytical methods.

### Response #14

The lack of detection of OC pollutants in the water column is more a function of their hydrophobicity than it is of the analytical detection limits. This is not true for OC pollutants in sediment. In general, analytical laboratories are very responsive to the need to lower method detection limits when regulatory limits require detections of compounds at lower and lower concentrations (e.g., laboratories can now routinely detect selenium at concentrations lower than the CTR chronic freshwater criterion of 5 µg/L). EPA Method 8270 can be used for analysis of OC pollutants in sediment and fish tissue. However, one of the problems with EPA Method 8270 is that it is not a very sensitive method for toxaphene analysis (Rich Gossett, CRG Marine, electronic mail dated August 9, 2007; Attachment I). This is because toxaphene is a mixture of several hundred compounds and it tends to fragment during analysis so much of the signal can be lost.

Another method currently being used to detect total toxaphene in sediment and fish tissue, which overcomes some of these limitations, is Negative Ion Chemical Ionization (NICI or NICI) gas chromatograph mass spectrometer (GCMS). The use of NICI is allowed as part of EPA method 8270 and can detect toxaphene at concentrations below the TMDL numeric target for sediment of 0.1 ppb (Rich Gossett, CRG Marine, e-mail dated August 9, 2007;

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Attachment I). The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis (e.g., \$200/sample for traditional Method 8270 analysis versus \$250/sample for the NICI analysis).

EPA's Office of the Inspector General (OIG) is recommending that toxaphene be analyzed using a new analytical method that combines a gas chromatograph with electron capture detector (GC/ECD) with a negative ion mass spectroscopy (NIMS) to test for toxaphene degradation products in environmental samples (EPA OIG Report No. 2006-P-00007; <http://www.epa.gov/oig/reports/2006/20051216-2006-P-00007.pdf>). In the environment, the original toxaphene mixture ("technical toxaphene"), which is composed of several hundred compounds, degrades and the components lose chlorines (dechlorination). The degradation products appear different to the testing instruments than the technical toxaphene mixture as a result of the dechlorination process (EPA OIG Report No. 2006-P-00007). However, since the analytical standard is based on technical (non-degraded) toxaphene, it may not detect all of the degradation products.

The NIMS method provides definitive test results because the technique generates a mass spectrum for each compound in an environmental sample, providing a "chemical fingerprint" of the degradation products. While the toxaphene sediment numeric target of 0.1 ppb will be at the low end of the detection range for this new method (K. Maruya, SCCWRP electronic mail dated August 8, 2007; Attachment I), the NIMS method can definitively determine whether or not toxaphene degradation products are present (EPA OIG Report No. 2006-P-00007). The analytical cost per sample using NIMS may initially be higher than the current analytical methods, but the cost per sample should come down as the method is more widely accepted and used.

**Comment #15**

Part of the debate on appropriate sediment targets stems from the fact that the State of California does not currently have adopted sediment quality objectives. However, the State is actively developing such objectives. This effort is not mentioned in the document and it is a critical piece of information that needs to be included. It is most likely that during the initial implementation phase of this TMDL, these objectives will be completed and adopted. At that time, those adopted numeric criteria would be the appropriate targets to assess impairment. However, until those objectives are adopted, the selection of appropriate sediment targets is a key and fundamental issue.

**Response #15**

The State of California's pursuit of sediment quality objectives is mentioned in the OCs TMDLs technical report in Section 3.2.4 on page 38 and in Section 3.4 at the bottom of page 40. The report acknowledges that "...the results of their efforts may enable refinement of sediment targets, ensuring that the most sensitive wildlife receptors in Newport Bay are protected, in future phases of these TMDLs." The recommended implementation plan allows for the formation of an Independent Advisory Panel (IAP) to assess the TMDL numeric targets, help guide special studies and prioritize implementation actions.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #16

The Office of Environmental Health Hazard Assessment (OEHHA) is currently in the process of revising the screening values. This effort needs to be included as it has potentially significant effects on findings of impairment. Regardless of the outcome of the debate regarding appropriate standard selection, this information needs to be included in the Staff Report.

Response #16

Consistent with the State Listing Policy, exceedances of OEHHA screening values (SVs) are being used in the OCs TMDLs impairment assessment as thresholds to indicate that contaminants have bioaccumulated in fish tissue to levels that may be of concern to human health and that threaten to violate the first narrative toxics substances water quality objective. The use of the OEHHA screening value for interpreting narrative water quality objectives is allowed by section 6.1.3(2) of the State Listing Policy. The issue regarding screening values was addressed during the development of the State Listing Policy. The State Listing Policy precludes the use of draft guidelines; OEHHA staff has indicated that they do not recommend using the draft SVs because there is no guarantee that draft SVs will be finalized at those same numbers (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I).

Comment #17

Section 3.3 of the staff report discusses the primary targets but there is no mention in the fish tissue section regarding why it is less valuable as a primary target than sediment. Fish tissue values are most likely the best indicator of impairment as fish are not an indicator, but rather, the primary endpoint that is supposed to be protected. Both water values and sediment values are only indicators of potential harm to the endpoints (i.e. fish). Therefore a direct measure of fish tissue is best approach to assess impairment. As has been learned from the Nitrogen and Selenium Management Program, direct measurement of the endpoints (fish and birds) is by far the most effective tool to understand the overall impacts of a particular pollutant. By placing a greater weight on sediment values as opposed to fish tissue, the real impact is lost amidst perceived impact.

Response #17

Section 3.4 of the OCs TMDLs technical staff report discusses the reasons why sediment targets were prioritized over water column and fish tissue targets as follows:

- (1) The OC pollutants are directly associated with fine sediment;
- (2) The OC pollutants are primarily transported within the watershed via sediment transport;
- (3) Limited water column data are currently available;
- (4) Impacts to the biota occur through bioaccumulation and biomagnification of the OC pollutants, and these impacts can ultimately be related to concentrations in sediment; and
- (5) Attainment of sediment targets should result in attainment of water column criteria and tissue screening values, and thus should offer protection of aquatic life, wildlife, and human health.

## ***Attachment C5 – Response to Local Agency/Municipality Comments San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The origin of the assertion that fish are the endpoint of concern is not clear. As stated in the Response #11, the TMDLs must assure that all beneficial uses are protected; this requires that TMDLs be established to protect the biota in the Bay, not merely fish.

### Comment #18

While the Staff Report recognizes that non-point discharges that originate from other areas are found in the MS4 system, it should be noted that the MS4 system is not the actual source of the OC compounds, just the conveyance system.

### Response #18

Comment noted.

### Comment #19

The Staff Reports states that *“rising groundwater is potentially a substantial source of OCs in the watershed”* (pg. 52). However, the Staff Report also states that OCs are *“primarily associated with organic matter and fine sediments, and they do not tend to migrate into ground water”* (pg. 43). The County agrees with the latter statement and supports management actions and studies that focus on sediment and not groundwater. It is widely accepted that sediment is the major source for organochlorinated compounds as they are hydrophobic and attach to fine particles. While concentrations of these compounds in water may be a potential data gap, the likely contribution of these compounds via water is substantially less significant than via sediment transport.

### Response #19

The statement in the staff report was predicated on the analytical results received for groundwater samples that were collected from monitoring wells in a shallow aquifer that showed detections of DDT. Subsequent monitoring also showed similar concentrations of DDTs in groundwater samples and DDT has also been found in groundwater samples collected in the Calleguas Creek watershed in the Los Angeles region (LWA 2005). Regional Board staff has asked that the analytical results be checked to determine whether or not the reported detections are real or the result of analytical error or cross-contamination. The shallow aquifer that underlies portions of the San Diego Creek watershed provides around 85% of the perennial flows in San Diego Creek and its tributaries. If organochlorine compounds are pervasive in this aquifer, even though they may be at very low concentrations, the high volume of groundwater present as base flows in the creek that enter the Bay may in fact prove to be a significant long-term source of these contaminants. However, the primary focus of future studies and BMP implementation is on further reducing organochlorine compounds associated with sediment loads, not groundwater, and it is likely that these detections in groundwater are either an artifact from the analytical laboratory or sampling equipment or are limited in extent.

### Comment #20

The significant impact of selecting appropriate sediment targets not only impacts findings of impairment, but also the loading capacities that are calculated for San Diego Creek, as well as Newport Bay. Therefore, these targets must be based on the best available science.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #20

While assertions have been made that the proposed organochlorine compounds TMDLs are not scientifically defensible or are not using the best available science, the scientific validity of the TMDLs has been confirmed by three independent expert peer reviewers (see peer review comment letters (Attachment F) or peer review comments and responses (Attachment C3), State Water Board staff, and U.S. EPA Region 9 staff. In a letter dated January 11, 2007, to Board Chair Beswick (Attachment G), the U.S. EPA indicated its support for the proposed TMDLs, explicitly stating that they meet all regulatory requirements and will be approvable upon submittal to EPA. Scientific defensibility is a fundamental TMDL regulatory requirement; EPA specifically stated that the selected numeric targets are appropriate, and noted that they have been widely used in California to address impacts from bioaccumulative toxic pollutants.

Comment #21

Section 5.2.2 must consider the most recent RDMD sediment data in order to appropriately calculate the sediment load to Upper Newport Bay.

Response #21

See Response #6.

Comment #22

Per Section 6 of the Staff Report, where calculated existing loads are less than the calculated loading capacity, the total TMDL allocation is set at the existing load. Existing loads were back-calculated from fish tissue values and are not based on actual monitoring data, which therefore has the potential for a large margin of error. Conceivably, when monitoring of pesticides associated with sediment is sufficient to compare to the load allocations, the loads could be less than the calculated loading capacity, but higher than what was determined to be the existing loads based on fish tissue data. The Staff Report states that *“During implementation, sources will be better evaluated, and allocations may be revised in the future”* (pg. 73). Loading capacities should also be included in that statement. It is understood that anti-degradation policy procedures preclude establishing allowable loads greater than existing loads. However, as stated above, the data on which existing loads were calculated has a strong margin of error and may not actually represent the existing loads. This acknowledgment should be included in the Staff Report to ensure that loading capacities can be revised based on empirical data in the future.

Response #22

Existing loads were back-calculated from fish tissue only for San Diego Creek. Pollutant loading to Newport Bay was estimated based on the amount and distribution of sediment deposited as modeled by Resource Management Associates (RMA) for the USACOE (1997, 1998) and sediment chemistry data from Bay and others (2004; SCCWRP Technical Report 433). The uncertainties associated with the existing load calculations are discussed in Section 6.0, TMDLs, Load Allocations, and Margin of Safety, on pages 77 and 78 of the technical staff report. For the OCs TMDLs, allocations would not be revised without first revising the loading capacities as the allocations are contingent on the loading capacities.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Comment #23**

The target compliance date needs to be added to Tables 6-2a and 6-2b in the staff report. The compliance date is not mentioned until pg. 98 which makes it unclear as to when these allocations and targets are effective.

**Response #23**

The compliance date has been added to the footnotes of the corresponding tables in the Basin Plan Amendment (BPA Tables NB-OCs-9 and NB-OCs-10).

**Comment #24**

In Table 6-3 of the staff report, the calculation used to determine the contribution from urban runoff results in an allocation of 36%. For comparative purposes, the sediment discharge summary from 2004-2005 shows that the Santa Ana-Delhi sub-watershed (a significantly urbanized area) discharges orders of magnitude less sediment than the San Diego Creek and Peters Canyon Wash sub-watersheds (areas that are actively under development and not fully urbanized). See table from the Upper Newport Bay/San Diego Creek Watershed Sediment TMDL 2004-2005 Annual Report (Table 20). This difference in sediment transport from urbanized areas compared to actively developing areas calls into question the extent of urban areas as a source for organochlorine compounds, and thereby, the extent that the municipal urban storm water program should be responsible for such discharges. Additionally, this discrepancy is especially significant when determining compliance with the allocation. Historically, the urban runoff allocation in a TMDL has been assessed by monitoring certain channels throughout the watershed. However, these channels contain discharges from multiple sources, such as groundwater, other permitted dischargers, etc. Therefore, a better sub-watershed to represent actual urban runoff may be the Santa Ana- Delhi Channel, compared to other locations throughout the watershed.

**Response #24**

While the Santa Ana-Delhi Channel (SADC) may be more representative of urban conditions, the watershed is roughly one quarter the size of the San Diego Creek watershed and only contributes about 10 percent of the freshwater flows to Newport Bay. Therefore, there may be additional confounding factors that would need to be analyzed or considered before determining whether or not the SADC sub-watershed would be more representative of urban runoff than the San Diego Creek watershed. The County of Orange Resources & Development Management Department (RDMD) is currently conducting a study to evaluate legacy organochlorine pesticide and PCBs mass loadings with respect to geographic location, flow, sediment particle size, and total organic content within the San Diego Creek/Newport Bay watersheds. The information gathered by the study will assist with the quantification of existing loads and identification of active sources; it could also be used to reassess the TMDL allocations.

**Comment #25**

RDMD supports refocusing the implementation plan to (1) prioritize certain studies, (2) determine which studies are most beneficial and effective, (3) ensure that certain technical issues are addressed in order to re-evaluate the TMDL by the explicit TMDL re-opener, and (4) balance the implementation plan to include toxicity as a whole, and not just legacy pesticides, to effectively implement management actions that result in real water quality



**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

improvement. Until such time as the watershed stakeholders and Regional Board staff can discuss the extent of flexibility this collaborative program could provide for initial implementation, additional detailed comments on the implementation plan as currently drafted are being provided.

Response #25

Comment noted. See also Response #1 and #5.

Comment #26

The Staff Report States, “A TMDL does not establish new water quality standards. A TMDL is a management plan through which existing narrative or numeric water quality objectives and beneficial uses are to be achieved. An implementation plan must be developed to ensure that the TMDL achieves its purpose” (pg. 81). Part of the struggle with the development of this TMDL is that the water quality objectives that pertain to organochlorine compounds are narrative and not numeric. Other guidelines, that are not adopted water quality criteria and that were not developed for such purposes, have therefore been used in assessing impairment, determining loading capacities, and developing waste load and load allocations. However, there is one effort currently under way that should help to alleviate some of this struggle – the development of sediment quality objectives for the State of California. These objectives will not be fully developed and approved before the TMDL is adopted, but they will most likely be completed within the first five years of the implementation plan. Therefore, it needs to be noted that (1) the sediment guidelines currently chosen in the TMDL are not adopted water quality criteria and the promulgation of this TMDL does not indirectly approve those guidelines as water quality criteria and (2) the sediment targets will be replaced with the sediment quality objectives approved by the State of California, once those objectives are complete and adopted.

Response #26

See Response #15.

Comment #27

The Staff Report states that phased TMDLs are developed when for scheduling reasons, TMDLs need to be established “*despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future...*” (pg 81). RDMD supports the phased TMDL approach and agrees that this TMDL has significant data uncertainty and that the loading capacity and allocation scheme should be revised in the near future.

Response #27

Comment noted.

Comment #28

The Staff Report states that the MS4 permit will be revised to incorporate the monitoring and BMP-related tasks identified in Table 8-1 and other tasks in the implementation plan. As the lead Permittee, RDMD has significant comments on the proposed implementation plan. The Staff Report also states that a collaborative effort may be created to implement a

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

watershed-wide work plan that would supersede the requirements of the TMDL implementation plan (See Staff Report, pg. 94). If that statement is indeed accurate, then it is inappropriate to revise the MS4 permit until such time as the work plan is developed through the new collaborative program and approved by the Regional Board. If that statement is not accurate, then the flexibility given to the collaborative effort is negligible and therefore the program is likely to be created or supported by watershed stakeholders.

**Response#28**

The watershed-wide work plan is not meant to “supersede” the OCs TMDL implementation plan; it should be used as a tool to evaluate and prioritize the OCs TMDL implementation tasks, integrate them with other TMDL/permit requirements, and build a platform from which a more comprehensive plan can be developed to address a broader range of toxicity-related issues in the Newport Bay watershed. It is not necessary to delay revision of the MS4 permit until the work plan is completed; rather, the revised MS4 permit would reflect relevant TMDL implementation tasks, including the opportunity to participate in the work plan approach (Task 7 of the recommended implementation plan). If and when the work plan is developed and approved by the Regional Board, inclusion of the work plan tasks and schedules could be coordinated with further revision of the MS4 permit. The MS4 permit includes a re-opener that allows revision of the permit whenever TMDLs are adopted (see Finding #42 in Order No. R8-2002-0010).

**Comment #29**

The Staff Report states that OC compounds tend not to migrate into groundwater. The likely contribution of OC compounds from ground water sources is negligible as the compounds have *“low water solubility (i.e. hydrophobic), with high Log Kow; they are primarily associated with organic matter and fine sediments”* (Staff Report, pg. 43) and *“...because the OC pollutants are hydrophobic and low water solubility, existing data showing detectable concentrations of these contaminants are limited”* (Staff Report, pg. 33) and *“Monitoring data show that a “reservoir” of historically-deposited organochlorine compounds exists in terrestrial soils...and that erosion of these soils continues to contribute low levels of contaminants to San Diego Creek and Newport Bay”* (Staff Report, pg. 50, emphasis added). While quantifying the presence of OC compounds in ground water discharges may technically be a data gap, filling that data gap is not an efficient use of monitoring resources due to the acknowledged limited presence of OC compounds in water. The primary monitoring effort should be on sediment and soils, not on groundwater discharges. The efficacy of such an effort (i.e. information gained vs. cost to obtain such information) should be discussed as part of the development of the work plan for the collaborative program. Until such time, revising the existing permit is inappropriate.

**Response #29**

See Response #19.

**Comment #30**

Staff Report Table 8-1, pg. 88: It is unclear from this table which party is expected to undertake each of the implementation items and why.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #30

The parties responsible for implementation of each of the tasks are identified in the discussion of each of the tasks.

Comment #31

The study suggested in Section 8.3.3 of the November 17, 2006 OCs TMDLs technical staff report is one example of where the implementation plan needs to be refocused. Instead of a list of data gaps and studies that must be completed to fill in those gaps, a more appropriate approach is to start downstream and work upstream. Meaning, first, assessments must be completed to determine where exceedances are occurring and then major sources should be tracked upstream. Requiring an assessment of all open space does not consider (1) if OC compounds were ever applied to the open space, (2) the value of this data (i.e. how would it be used?), and (3) the feasibility of collecting wet weather runoff samples from an open space (i.e. how will flow be measured?). As a point of comparison on the third point, the study currently being conducted by RDMD to assess fluvial sediment concentrations has been extraordinarily difficult to implement. The fluvial sediment study is being conducted in conditions significantly more ideal and under more controlled circumstances than trying to characterize loading from an open space. Even in those circumstances, the collection of fluvial sediments from channels during rain events is extremely challenging (and the data to date mostly show non-detectable levels of OC compounds).

Response #31

If the development and implementation of a comprehensive work plan is pursued (Task 7 of the recommended implementation plan), one of the first tasks would be to establish an Independent Advisory Panel (IAP) and to develop a recommended plan that will address toxicity issues in the Newport Bay watershed in a coordinated and prioritized manner. The stakeholders who participate in this effort (Working Group) will be required to evaluate, with input from the IAP, the other individual tasks identified in the recommended implementation plan, to prioritize them and to justify to the satisfaction of the Regional Board at a public meeting, any recommendations for excluding or modifying one or more of these tasks. At that time, if it is determined that open-space monitoring for organochlorine compounds is either not necessary or will be addressed through a separate study or program, the Working Group will have the option to eliminate that task from the work plan, or to make other suitable modifications, provided that adequate justification is provided to the Regional Board, which will approve the proposed work plan prior to implementation.

Comment #32

It should be clarified that the purview of SWPPP enforcement falls to the State, not the MS4 Permittees. This requirement is a major undertaking, based on current experience with the evaluation of erosion control BMPs for building pads through the storm water program. This project was envisioned as a small effort but has turned out to be a multi-year, costly investigation. Therefore, the extensive evaluations proposed in the Draft OC TMDL may likely be beyond the ability of the storm water program participants.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #32

BPA Task 4, Develop and Implement Appropriate BMPs for Construction Activities (page 24, first paragraph), has been amended as follows:

*“To address these program improvements, Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board’s expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. ...Upon completion of needed outreach and training concerning the requirements of the SWPPP Improvement Program, SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly.”*

However, pursuant to existing MS4 permit requirements, it is the responsibility of the MS4 permittees to ensure that both visible and non-visible pollutants do not leave construction sites.

Comment #33

Staff Report, Section 8.3.4, Evaluate Sources of OCs to San Diego Creek and Newport Bay; Identify and Implement Effective BMPs to Reduce/Eliminate Sources, pg. 93: This type of study should be more fully discussed and developed through a collaborative program. It would seem appropriate that this type of study would be a higher priority than others (such as monitoring open space and groundwater discharges) as it first seeks to identify sources causing impairment, rather than just filling a data gap. However, the language stating *“the Permittees shall implement additional/enhanced BMPs as necessary to ensure that organochlorinated compounds discharges from significant land sources to surface waters are reduced or eliminated”* (pg. 93) places the entire burden of reducing or eliminating sources of OC discharges solely on the municipal storm water program. Once sources are identified, the burden of elimination should be on the appropriate party that is responsible for the source itself, not entirely on the MS4 program. Urban areas are likely a limited source of OC compounds, therefore it is more appropriate to pursue a collaborative approach to reducing these discharges.

Response #33

Comment noted. See Response #31. This issue can be addressed in the development and implementation of a comprehensive work plan (Task 7), if pursued by the stakeholders.

Comment #34

Staff Report, Section 8.3.5, Evaluate Sources of OCs to San Diego Creek and Newport Bay; Identify and Implement Effective BMPs to Reduce/Eliminate Sources, pg. 93: There are four active hazardous waste collection centers in Orange County. The wastes collected at these sites are reported annually through the MS4 program. Data to date show this program is effective, as there continues to be an increasing use of these facilities. While any pesticides that are collected are not specifically tallied by type, they are tallied under the category of “poisons.” The storm water program continues to advertise the program and there is no reason to believe the current program it is not effective.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Response #34

Comment noted. During implementation of the OCs TMDLs, Orange County's hazardous waste collection program can be evaluated for its effectiveness and a determination made as to whether any additional steps are needed to ensure that all banned OC pesticides and PCBs are being properly disposed of within the Newport Bay watershed.

Comment #35

Staff Report, Section 8.3.6, Evaluate Feasibility and Mechanisms to Fund Future Dredging Operations, pg. 93: Upper Newport Bay is currently being dredged through a partnership of the US Army Corps of Engineers, Coastal Conservancy, and County of Orange. Significant amounts of sediment are being removed, thereby also removing associated OC compounds as well. Part of an implementation work plan should be an assessment of the Bay sediment post-dredging and the projected fish tissue concentrations as a result of the sediment removal to determine if future dredging would even be necessary.

Response #35

Comment noted. This task could be considered further as part of the development of a comprehensive Work Plan (Task 7 of the recommended implementation plan), if pursued by the stakeholders. As a matter of information, water column, sediment and fish tissue samples are now being collected by the California Department of Fish and Game (DFG) as part of a contaminant trend analysis program being funded currently by the State. These data should help to determine if bioavailable contaminants have increased or decreased as a result of dredging operations in the Bay. Projection of fish tissue concentrations may not be feasible as samples collected immediately after dredging operations may show temporarily increased concentrations of bioavailable contaminants as the result of the re-suspension of contaminated sediments into the water column during dredging operations. Trend data may have to be collected over a period of several years post-dredge to determine whether or not dredging operations resulted in the removal of contaminants (declining contaminant concentrations in sediment and fish) or exposure of previously buried contaminated sediments (increased contaminant concentrations in sediment and fish).

Comment #36

Staff Report, Section 8.3.7, Develop a Workplan to Meet TMDL Implementation Requirements, Consistent with an Adaptive Management Approach, pg. 94: As stated in the cover letter, RDMD supports the development of a collaborative program to implement a work plan for the TMDL implementation plan. It appears the intent of this section is to allow for flexibility in designing an effective implementation plan and thereby effective management actions due to acknowledged technical uncertainties. However, it is a bit unclear as to the extent of such flexibility should the stakeholders decide to develop a work plan. Specifically, the staff report states, *"To the extent of any conflicts between the individual tasks and schedules identified above and the prioritized plan and schedule identified in the workplan, the workplan would govern implementation activities with respect to stakeholders responsible for workplan development and implementation"* (pg. 94). As currently stated, the work that constitutes "identified above" is vague. For this collaborative program to be successful, the work plan must comprise the entire implementation plan. Otherwise, the studies and tasks that are currently required in the implementation plan are

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

too prescriptive and do not allow for the necessary adaptive management. Without flexibility, broad range support from watershed stakeholders is unlikely. Additionally, the timeframe allotted for the development of a work plan, 3 months from the date of State approval of the TMDLs, is too short. A more realistic timeframe is 6-9 months. For example, for the Nitrogen and Selenium Management Program, a draft work plan was complete at the time of permit adoption (December 2004). However, a final detailed work plan was not complete and approved by the Executive Officer of the Regional Board until July 2005.

**Response #36**

The cited language has been clarified in the proposed Basin Plan amendment as follows: *“To the extent that there are ~~of~~ any conflicts between the individual tasks and schedules identified in Table NB-OCs- 13 ~~above~~ and the prioritized plan and schedule identified in the ~~W~~work ~~P~~plan, the ~~W~~work ~~P~~plan would govern implementation activities with respect to stakeholders responsible for ~~W~~work ~~P~~plan development and implementation as part of the Working Group.”* Additionally, language has been added in the description of Task 7 to clarify the expectation that the individual tasks identified in Table NB-OCs-13 will be considered by the stakeholders during the development of a work plan and that where modification or elimination of one or more of these tasks is proposed, then the stakeholders must provide justification that will be considered by the Regional Board in approving the proposed work plan. Specifically, the language in Task 7 on p. 28 of the recommended Basin Plan amendment (Attachment to Resolution No. R8-2007-0024) has been modified as follows: “It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal.” (see also Response #31).

The work plan development time frame, as shown in Table NB-OCs-13 of the BPA, requires submittal of the work plan to the Regional Board after approval by the State’s Office of Administrative Law (OAL). OAL approval is not expected to occur until at least 6 months after Regional Board adoption of the TMDLs; however, experience suggests that OAL approval will likely not occur until 9 months or more after Regional Board adoption of the TMDLs. If the stakeholders begin development of the work plan immediately after the Regional Board adopts the OCs TMDLs, they should have sufficient time to complete it before the OAL approval due date.

**Comment #37**

Staff Report, Section 8.3.7, Revise Regional Monitoring Program, pg. 95: In 2005, the monitoring program for the MS4 program was revised in order to incorporate the suggested Regional Board revisions to the Regional Monitoring Program (RMP). At that time, revisions were made in the effort to address issues of concern for the various TMDLs in the watershed. As those revisions were made very recently, further revisions to the MS4 monitoring program seem inappropriate at this time. Through the development of a collaborative stakeholder program, assessing the need for additional studies and/or data

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

collections should be part of the work plan. Requiring such prescriptive changes again limits the flexibility of, and potential stakeholder support for, a watershed-wide effort. Additionally, as was discussed during the revisions of the MS4 monitoring program, the OC compounds are primarily associated with historical agricultural application. Therefore, monitoring of these substances is not appropriately addressed solely through an urban program.

**Response #37**

Revisions to the RMP can be made in parallel with, or predicated on, development of the comprehensive work plan, since the time frames for both tasks are the same (3 months after OAL approval—see second paragraph of Response #36). While some of the related implementation tasks, such as construction site monitoring and BMP implementation do fit with the MS4 monitoring program, other tasks are not appropriately addressed through this vehicle. Development of the work plan should therefore carefully consider which implementation tasks best fit into the MS4 RMP framework and which are best pursued through implementation of the work plan itself, special studies or other programs. Additionally, if the stakeholders provide adequate justification, the completion schedule for revisions to the RMP could be revised and included in the work plan itself.

**Comment #38**

Staff Report, Section 8.3.9, Conduct Special Studies, pg. 96: For a collaborative effort to be successful, there must be flexibility in the development of the program. Therefore, the list of special studies should be a starting point for discussions (i.e. are the studies the most beneficial use of resources? Will other studies provide better answers?) and not a requirement for compliance.

**Response #38**

The special studies listed in the OCs TMDLs November 17, 2006 technical staff report and in Task 9 of the recommended TMDLs implementation plan are studies that have been *recommended* by Regional Board staff based on input from the OCs TMDLs Technical Advisory Committee (TAC). Stakeholder contributions to these investigations are encouraged, though not required. Completion of these investigations would contribute to future refinement of the TMDLs. Conduct of these or other investigations must be considered as part of the development of the recommended work plan by the stakeholders.

**Comment #39**

Given the technical uncertainties associated with this TMDL, RDMD supports the explicit re-opener to reassess impairment, BMP effectiveness, and modifications to the TMDL.

**Response #39**

Comment noted.

**Comment #40**

The compliance date for TMDL targets and allocations should also be included in Tables 3-1 and 6-2b, and Table 8-1 should be clarified to better describe which party is required to do what task and by when.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #40

Table 3-1 (Tables NB-OCs-4 and 5 in the BPA) lists the numeric targets for the proposed TMDLs. Compliance with the targets is measured through compliance with the loads and allocations. Compliance dates are specified for the TMDLs and allocations; see footnotes to Tables NB-OCs-9 and 10.

Comment #41

As requested in the Staff Report, a more detailed analysis of the economic considerations of the proposed TMDL as they pertain to MS4 requirements are provided. RDMD has considerable experience in implementing studies and management programs similar to those suggested in the implementation plan (e.g., through the Nitrogen and Selenium Management Program, a sediment pesticide study funded through a PRISM grant, the NPDES program, RDMD's sediment program, the TMDL Regional Monitoring Program etc.). The costs outlined in the Economic Analysis table (pg. B-13) in Attachment B are therefore a very realistic assessment of the total financial impacts. Note that the cost estimate only includes studies and efforts directly prescribed in the draft implementation plan and only costs that are additional to current efforts and studies. A range is given in each cost estimate as it is difficult to precisely assess a study cost without first fully developing a study design.

The total estimated financial impact to the MS4 Permittees from the studies identified to be completed in the first five years (Phase I) of the proposed implementation plan is estimated to range between \$5,025,000 to \$7,850,000. As a point of comparison, the Nitrogen and Selenium Management Program budget is \$2,500,000 over five years. The higher program cost estimate is due to the fact that when the NSMP was started, there was a pre-existing large knowledge base regarding sources, loads, concentrations, hot spots, etc. However, for the OC constituents, there is a very small knowledge base (in fact, limited empirical data exists) which would have to be developed in order to complete the studies in the proposed implementation plan. Additionally, the per sample analytical cost for OC compounds and toxicity testing is significantly higher than selenium and nitrogen analysis.

To put the estimated study costs in perspective with current expenditures, through existing TMDLs (fecal coliform, nutrients, sediment, and toxics (excluding OC compounds), the Newport Bay watershed stakeholders fund approximately \$1.5 million of studies and implementation annually. The estimated cost of the proposed implementation plan (just for the identified studies and only legacy pesticides), would double the current expenditures for TMDL programs to roughly \$2.5 - \$3.0 million annually. Another frame of reference is the NPDES shared-cost budget. As the Lead Permittee, RDMD implements the full monitoring program for the stormwater program, which covers both North County (Santa Ana Regional Board jurisdiction) and South County (San Diego Regional Board jurisdiction). The annual monitoring budget for the entire stormwater program is approximately \$2.3 million. Comparatively, this proposed implementation plan would require spending over \$1 million annually on one watershed, for one group of pollutants in which there is substantial technical doubt that focusing on legacy pesticides will effectively reduce toxicity in the watershed.



***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #41

Comment noted. Please also see Response #5. We appreciate the economic information provided by RDMD and that information has been considered in revising the proposed Basin Plan amendment to provide enhanced emphasis on the development of a comprehensive and integrated Work Plan. This is consistent with the commentator's recommendations in their January 12, 2007 comment letter (see, for example, Comments 3 and 4, above). Development and implementation of this Work Plan, if pursued by the stakeholders, will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned. Recognition of the resource efficiency of this approach, and of the opportunity to address the multiple water quality problems affecting Newport Bay and its watershed in the most timely and effective manner, is implicit in the inclusion of the Work Plan approach in the recommended implementation plan (Attachment 2 to Resolution No. R8-2007-0024, 4.b.3., Task 7).

Comment #42

The economic analysis as provided in the Staff Report significantly underestimates the cost of such programs. The range provided in the Staff Report of less than \$50,000 to several hundred thousand is too low by orders of magnitude. Table 9-2 should be revised to include the detailed cost information provided in the table in Attachment B. Additionally, throughout the proposed implementation plan, it is difficult to follow which party is being requested to implement which action, and in the instance of this particular table, the citation in the Staff Report where the action is described. Table 9-2 should also be revised to clearly outline this information.

Response #42

No changes to the November 17, 2006 OCs TMDLs technical staff report are being made as a matter of procedure (this report was not issued as a draft); modifications to the proposed Basin Plan amendment that result from consideration of comments such as those provided by RDMD are described in supplemental staff reports and shown in strikeout/underline form in the recommended Basin Plan amendment. That said, the economic information provided by RDMD in its comments, as well as all other comments provided on the recommended TMDLs, become a part of the administrative record for the TMDLs. The development and implementation of a comprehensive, watershed-wide work plan (Task 7) if pursued by the stakeholders, will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence) TMDL implementation tasks, taking economic considerations into account, and to assure that implementation responsibilities are properly apportioned. See also Response #30.

Comment #43

The Draft OC TMDL Staff Report was only fully available for public review as of November 17, 2006. Comments to the Regional Board are due January 12, 2007. This time period has not been sufficient for stakeholders to review the complex and detailed staff report and to discuss any concerns with Regional Board staff. There are sections of the document where staff has specifically requested input from stakeholders, such as Section 8.0

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

(Implementation Plan) and Section 9.0 (Economic Considerations). But the time allotted for comment does not enable stakeholders to review how these requested details are incorporated into the final document before the Basin Plan Amendment is considered by the Regional Board for adoption.

**Response #43**

Regional Board staff initially requested that comments on the OC's TMDLs, especially comments that provided specific input on the implementation plan and economic considerations, be submitted by January 12, 2007, so that staff could revise the BPA before the scheduled March 2, 2007 Board adoption hearing date. However, staff also informed the stakeholders at that time that they could submit comments on the TMDLs up to the time of Regional Board consideration of the TMDL Basin Plan amendment at a public hearing. Since that time, the public hearing date has been rescheduled to September 7, 2007, so comments on the OCs TMDLs can be submitted until then. Written responses to comments submitted at least two weeks prior to the hearing date will be provided.

**Comment #44**

There are significant technical concerns raised by a group of stakeholders that have not been addressed. The Technical Advisory Committee needs to be reconvened, before the Basin Plan Amendment is considered for adoption, in order to address these technical concerns.

The Staff Report states that a Technical Advisory Committee (TAC) was formed to “review draft sections of the TMDLs and make comments and suggestions” (pg. 115). In reviewing the comments submitted by TAC members, it is difficult to determine how the comments and suggestions of the TAC were or were not considered in the final TMDL. Also, the TAC did not review the document as a whole, or review sections after comments were submitted. And, not all TAC members participated in reviewing the sections of the TMDL as they were provided (some members only participated in one meeting). Considering the very complex nature of this TMDL, the level of review the TAC was able to provide does not seem appropriate or effective. Therefore, the request to reconvene the TAC not only will provide the opportunity for the TAC to address the technical issues raised by stakeholders, but should provide the TAC with the opportunity to review the document in its entirety and how their comments and suggestions were, or were not, addressed.

**Response #44**

The Technical Advisory Committee (TAC) was composed of members with a broad spectrum of backgrounds and included staff from the University of California - Riverside, the University of Arizona, the US Fish and Wildlife Service (FWS), the Southern California Coastal Water Research Project (SCCWRP), the San Francisco Estuary Institute (SFEI) and the California Office of Environmental Health Hazard Assessment (OEHHA). Participation in the TAC was strictly voluntary and members attended meetings as able. TAC member comments were carefully considered by Regional Board staff and incorporated into the November 17, 2006 TMDLs technical staff report and reflected in the proposed Basin Plan amendment where appropriate.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

The technical concerns raised by the group of stakeholders primarily centers around Regional Board staff's selection of TMDL numeric targets for the organochlorine compounds TMDLs. The assertion was made that the targets rely on flawed and/or outdated data and incorrect analysis presented in the literature, and that the target/TMDLs are thus not scientifically defensible. These assertions are based primarily on the opinion of one commenter, Dr. James Byard, and the Flow Science reports based on his commentaries (see Attachment D). The "errors" asserted by Dr. Byard and assumed in the Flow Science reports are not errors in the underlying data or in the database but rather reflect differences in the interpretation of the underlying data, differences in the analysis of those data, and/or, perhaps most importantly, differences in the selection of the level of protection that ought to be provided to humans and wildlife. (Please see Attachment C1, Responses to Flow Science, Inc. reports, which discusses these issues in more detail.)

Dr. Byard, an independent toxicologist, and Dr. Ronald Tjeerdema, University of California – Davis, were hired as consultants by The Irvine Company to respond to the Regional Board's efforts to adopt TMDLs for the organochlorine compounds. Both Dr. Byard and Dr. Tjeerdema were invited by Regional Board staff to participate in the TAC. Drs. Byard and Tjeerdema physically attended TAC meetings on May 4, July 13, and October 12, 2006 to provide review and discussion of portions of the draft technical staff report. At each meeting, Dr. Byard expressed his concerns to the other committee members regarding the targets, and in particular his belief that the majority of staff's recommended targets were in error and were too low. However, Dr. Byard refused to participate fully in the TAC and did not fulfill the charge to provide review comments on different sections of the technical staff report as requested. In his October 10, 2006 letter to Dr. Kathy Rose, Regional Board staff, Dr. Byard stated the following:

*"At this point you are expecting comments on the more recently completed parts of the draft Staff Report, including the implementation plan. However, my comments will remain focused on the numeric targets. The reason is that the targets in the draft staff report are outdated, misrepresented or in error. To discuss other aspects of the draft Staff Report – including the implementation plan – when the targets are wrong, would be inappropriate."*

While Dr. Byard is certainly entitled to his own opinions, the TAC did not, as a whole, find fault with the targets proposed by Board staff. Other members of the TAC provided comments on the targets, indicating support for the technical approach but suggesting, based on independent risk assessments, that the targets might in fact need to be more stringent than those proposed by Board staff to assure protection of sensitive Newport Bay species. Therefore, staff believed that the numeric targets as presented in the TMDLs technical staff report were scientifically justified and did not require revision, and that further discussion was not necessary at this time, especially since staff's numeric targets did not differ substantially from those used by the USEPA in their 2002 technical TMDLs for Toxic Constituents. Moreover, Board staff had proposed phased TMDLs, with a specific re-opener, to allow for uncertainties regarding the numeric targets to be addressed and the TMDLs to be refined accordingly.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The proposed TMDL implementation plan has been revised in response to stakeholder concerns and recommendations to provide enhanced emphasis on the opportunity for the stakeholders to develop, and implement upon Regional Board approval, an integrated and comprehensive work plan to address toxic substance and other water quality problems affecting Newport Bay and its watershed. If, as expected, this work plan approach is pursued by the stakeholders, a first step is expected to be the formation of an Independent Advisory Panel (IAP). The IAP is expected to help the Regional Board and stakeholders to address TMDL technical uncertainties, including the numeric targets, and to provide guidance and recommendations on the development and implementation of work plan tasks.

**Comment #45**

As the Staff Report is the basis for the Basin Plan Amendment, all comments on the Staff Report thereby apply to this Basin Plan Amendment. References have been directly provided on specific sections that are very similar in content to the Staff Report.

**Response #45**

Comment acknowledged.

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***Marty Bryant, City of Irvine***

**Comment #46**

We believe that the Regional Board should take the time to thoroughly examine the accuracy of the information used to develop the organochlorine compounds TMDLs and the information provided by the County of Orange and other stakeholders prior to adoption, and as a matter of good public policy. We support the information provided in the County of Orange letter dated January 12, 2007.

**Response #46**

Board staff critically reviewed all available data and peer-reviewed guidelines in making target and TMDL recommendations. This decision-making process is discussed in detail in the November 17, 2006 technical staff report (Section 3.0). The Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by State Board and USEPA Region 9 staff. Extensive discussions regarding these TMDLs have been held with the County and other stakeholders and the Basin Plan Amendment (BPA) has been revised accordingly. Every effort has been made to address comments in an appropriate manner. Please see Attachment C5 (pages 2-24) for our responses to the County of Orange's January 12, 2007 comment letter.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

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***Steve Rosansky, City of Newport Beach***

Comment #47

The City's Coastal-Bay Water Quality Citizen's Advisory Committee reviewed and discussed the proposed TMDL and Basin Plan Amendment at its February 8, 2007 meeting and agreed that the overall approach envisioned by the Board staff for the OC TMDL, including the following specific aspects of the proposed BPA, are appropriate and proper:

- The Implementation Tasks and Schedule Table (NB-OCs-13, Page 13 of the Attachment to Resolution R8-2007-0024), which allows for two implementation phases, the first involving detailed study and review of data;
- The overall "Phased Approach" of the TMDL as discussed in Section 4.b.3 (Page 8); and
- The "Reopener" provisions in Task 10 (Phase II Implementation, Page 24).

With these comments and the above provisions in the proposed Basin Plan Amendment and Resolution #R8-2007-0024, the Newport Beach City Council unanimously determined on February 27, 2007, to support the Board's adoption of the Organochlorine Compounds (OC) TMDL and related BPA.

Response #47

Regional Board staff very much appreciates the City's review and support of the Organochlorine Compounds TMDLs for the Newport Bay watershed.

Comment #48

While we are very supportive of the Board's work and proposed Implementation Tasks, we must note that our City (along with other stakeholders) will continue to look with caution to the costs associated with the OC TMDL (and other TMDLs). We know that the Board must consider economic and other cost impacts as a part of any Basin Plan effort, and respectfully urge you to be cognizant of these concerns.

Response #48

Regional Board staff is aware of the stakeholders' concerns regarding the economic implications of implementation of the TMDLs in the watershed. Board staff has considered the economic implications of the proposed TMDLs (see, for example, the November 17, 2006 organochlorine compounds TMDLs technical report and the Substitute Environmental Document (Attachment B to the September 7, 2007 supplemental staff report). The economics information provided by the County of Orange Resource Development and Management Department (RDMD) (Attachment G) was also considered in developing the revised TMDL Basin Plan amendment. The enhanced emphasis in the recommended implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 7) on the opportunity to establish a collaborative work plan and to form an Independent Advisory Panel (IAP) to address technical uncertainties, will allow Regional Board staff and stakeholders to prioritize and evaluate the proposed implementation tasks so that water quality standards issues can be addressed in the most effective and resource-efficient manner.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

**William Huston, City of Tustin**

**Comment #49**

It is in the best interest of the City to ensure that the City resources are expended in a manner that will address the actual cause of toxicity in the Upper Newport Bay and that will fix the existing water quality problem.

**Response #49**

Regional Board staff is aware of the stakeholders' concerns regarding the economic implications of implementation of the TMDLs in the watershed and the source of acute toxicity in Newport Bay. Board staff has considered the economic implications of the proposed TMDLs (see, for example, the November 17, 2006 organochlorine compounds TMDLs technical report and the Substitute Environmental Document (Attachment B to the September 7, 2007 supplemental staff report). The economics information provided by the County of Orange Resource Development and Management Department (RDMD) (Attachment G) was also considered in developing the revised TMDL Basin Plan amendment. The enhanced emphasis in the recommended implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 7) on the opportunity to establish a collaborative work plan and to form an Independent Advisory Panel (IAP) to address technical uncertainties, will allow Regional Board staff and stakeholders to prioritize and evaluate the proposed implementation tasks so that water quality standards issues can be addressed in the most effective and resource-efficient manner. The enhanced emphasis on the work plan approach is consistent with the recommendations of RDMD and other stakeholders (see, for example, Comments # 3 and #4, above). The TMDL implementation plan includes a task to evaluate potential sources of sediment toxicity in both San Diego Creek and Newport Bay (see Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3, Task 9 (1)).

**Comment #50**

The City is concerned that the proposed TMDLs are based on flawed studies, including errors in the methodology employed in these studies. Therefore, the water quality targets are not technically defensible as required by the federal Clean Water Act, the California Water Code, and the Regional Board's history of good science.

**Response #50**

The Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by State Board and USEPA Region 9 staff. In contrast, the assertions made by some stakeholders that the proposed TMDL targets are erroneous and scientifically unjustified are not defensible and are based primarily on the opinion of one commenter, Dr. James Byard, and the Flow Science reports based on his commentaries (see Attachment D), which have not been subject to peer review and scientific validation. The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets and loads as new information becomes available. An IAP will be established during implementation of these TMDLs as part of a coordinated, comprehensive work plan approach (see Task 7 in the proposed implementation plan); one

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

of the first tasks of the IAP will be to review and revise, if necessary, the TMDL numeric targets.

**Comment #51**

The City is also concerned that the TMDL staff report and attached CEQA check list does not adequately address the scoping comments previous submitted by the City and lacks adequate analysis of the proposed [Basin Plan] Amendment in the CEQA substitute environmental document.

**Response #51**

A Substitute Environmental Document (SED) (July 25, 2007) has been prepared and circulated for review in accordance with CEQA. The SED describes the CEQA requirements that pertain to the consideration of the proposed Basin Plan amendment to incorporate the recommended OCs TMDLs. The SED then provides the analyses required to comply with those requirements. An additional document, Findings of Fact and Statement of Overriding Considerations for the SED/TMDLs, will complement the SED and together these documents/analyses satisfy relevant CEQA requirements.

**Comment #52**

Ms. Schneider has acknowledged by email to Chris Crompton and the County of Orange that it is appropriate for the City of Tustin to submit (formally or informally) additional comments on the TMDL as cooperative work on the TMDL progresses by the stakeholders, and in order to assure a complete record, further the cooperative scientific discourse, and provide for consideration of all pertinent information by the Santa Ana Regional Board prior to its adoption of the [Basin Plan] Amendment. We appreciate the opportunity Ms. Schneider has provided to make additional submissions.

**Response #52**

Comments on the OCs TMDLs can be submitted up to the time of Regional Board consideration of the TMDL Basin Plan amendment at a public hearing. The public hearing date has been rescheduled to September 7, 2007, so comments on the OCs TMDLs can be submitted until then. Written responses to comments submitted at least two weeks prior to the hearing date will be provided.

**Comment #53**

The Staff Report characterizes MCAS Tustin as a point source for OCs TMDLs. It is our understanding that the MCAS Tustin site is being characterized as a point source solely because that characterization provides a convenient category for referencing the regulatory status of the property based upon prior and/or current issuance of NPDES permits applicable to the site for discharges related to remediation of pollutants associated with former military uses. The city further understands, but the City requests that the record clarify that the characterization in the Staff Report is not intended as a physical characterization of the site or runoff from the site as a point source.

Based on the definition provided in the NPS Guidance and NPS Implementation Policy, urban and construction runoff, including post-redevelopment urban runoff from MCAS Tustin is, from a physical standpoint, a NPS. In addition, based on the available regulatory

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

guidance, discharges of runoff from MCAS Tustin are more properly characterized as nonpoint sources of pollution for purposes of TMDL development and other regulatory purposes, even if under some circumstances they are subject to NPDES permitting requirements as “point sources.”

**Response #53**

As reflected in the comment, discharges to surface waters resulting from groundwater remediation activities at the MCAS Tustin site are regulated under NPDES permit issued by the Regional Board. In addition, MCAS Tustin is currently being developed for commercial and residential urban uses. These activities are or will be regulated under the statewide National Pollutant Discharge Elimination System (NPDES) general construction permit and the Orange County NPDES Storm Water permit for urban runoff. While it is recognized that stormwater and nuisance water runoff from the MCAS Tustin site, and future urban development at the site, have diffuse and diverse origins consistent with the traditional definition of non-point sources, regulation of discharges of pollutants associated with construction/urban runoff are now regulated under NPDES permit, pursuant to federal regulation. Therefore, urban runoff, including construction and post-development runoff, is no longer considered a non-point source, but is now classified as a point source.

The rationale for the City’s emphasis on the distinction between point and non-point sources is not clear. In either case, parties responsible for discharges from the MCAS Tustin site would be required to implement steps to assure that organochlorine compounds loadings from the site do not cause or contribute to violations of the recommended TMDLs, if approved. The City has committed to requiring effective erosion and sediment control measures during development of the site; effective BMP implementation is expected to be the principal means of assuring TMDL compliance.

**Comment #54**

Further with respect to the physical characterization of the site, the City requests that the record be corrected to eliminate Staff Report references to the site as a “reservoir” of organochlorine pollutants (Staff Report, p.56), as this characterization is inconsistent with the existing physical condition of the property of the site. See the discussion under Section I.B of this letter and the Letter Report dated January 11, 2007 from Harry Takach, PhD to Time Serlet, attached to this letter and incorporated herein by reference (the “Takach Report”).

**Response #54**

Regional Board staff believes that the City overstates the statements in the November 17, 2006 TMDLs technical staff report regarding the potential significance of OCs inputs from the former Tustin MCAS. Specifically, the TMDLs technical report states that a reservoir of OC pollutants *likely* exists at specific sites (p. 56, third paragraph) (italics added for emphasis). The November 17, 2006 TMDLs technical staff report was not issued as a draft and no changes will be made as a matter of procedure. Rather, modifications to the proposed Basin Plan amendment that result from consideration of comments such as those provided by the City are described in supplemental staff reports and shown in strikeout/underline form in the recommended Basin Plan amendment.



***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The TMDLs technical report acknowledges that the dearth of source data renders the source analysis in Section 4.0 primarily qualitative, and the proposed Implementation Plan is directed to a large extent to source investigation and subsequent follow-up based on the results. The intent of the source analysis is not to highlight or bias the discussion, nor to suggest that OCs discharges from the former MCAS are necessarily the cause of impairment in receiving waters affected by these discharges. Rather, relevant and available data and information are reported and then used to identify appropriate implementation activities. The proposed implementation plan includes several tasks (2, 3, 5, and 9) that entail additional source investigation, and follow-up actions, where necessary. It should be noted that Task 5 in the proposed TMDL Implementation Plan has been modified (see Attachment B to April 20, 2007 supplemental staff report) to specify that if the results of source evaluations indicate that additional OCs soil remediation is necessary on MCAS Tustin, the responsible parties for such remediation will be identified. The responsible party will be tasked to implement those portions of the BMP plan identified for the responsible party(ies) for MCAS Tustin. The proposed implementation plan also recognizes that review and, possibly, revision of the TMDLs will be necessary based on the results of these and other implementation tasks (see Task 10, Phase II Implementation).

Comment #55

MCAS Tustin is being remediated to allow for conversion and re-use for residential and commercial development. Homes have been built and occupied in some areas, and additional residential and commercial development is under construction. These conversion and re-use activities have occurred pursuant to Findings of Suitability for Transfer (FOSTs), as described in some detail in the attached Takach Report. FOSTs are prepared in accordance with the Department of Defense guidance documents, and contain findings and determinations, approved by regulatory agencies with oversight authority, regarding suitability of sites within MCAS Tustin for conversion to residential use, which has the most stringent requirements for organochlorine remediation of any land use. Given the existing condition of MCAS Tustin and proposed re-use, it is and has been factually clear that conversion must occur via demolition and construction activities. Prior to transfer and in connection with issuance of the FOST, written concurrence is provided by the regulatory agencies (EPA, DTSC, RWQCB) and/or in no further action determinations for sites to be transferred and converted to post-military uses are needed. The FOST and no further action determinations allow transfer for re-use, which has already occurred for some parcels within MCAS Tustin, and these regulatory actions do not prohibit any of the conversion activities (such as demolition, grading and construction) necessary to achieve re-use. Takach report, p.3.

Based on these documents, regulatory agencies, including the RWQCB, have already determined remediation is sufficient for re-use, which all oversight agencies have always understood will require demolition and construction activities within the former military base. Takach Report, p.3. As a result, the RWQCB, DTSC, and EPA have played a significant role in determining the protective levels of cleanup for the MCAS Tustin and have approved final clearances for transfer of ownership of MCAS Tustin land for future development by means of demolition and construction. The proposed OC TMDL conflicts with these previously issued approvals. Moreover, it would be inappropriate and without legal basis to characterize these previously issued approvals solely as approvals for post-development

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

residential and commercial use, without taking into account conversion activities (demolition, grading and construction) necessary to implement the approved post-development re-use. The FOST and no action determinations must, and do take into account re-use activities in their entirety, including conversion activities and post-development residential, commercial, park and institutional uses. Department of Defense Base Reuse Implementation Manual, Appendix F, Section 2.1.3; DoD Guidance on the Environmental Review Process to Reach a Finding of Suitability to Transfer June 1994. As a result, additional remediation should not be required under the TMDL to proceed with demolition, grading and construction activities within the MCAS Tustin.

Response #55

The actions discussed above occurred prior to the promulgation of USEPA's 2002 technical TMDLs for Toxic Constituents in the San Diego Creek and Newport Bay watersheds and did not consider water quality impacts that might occur from erosion and transport of soils offsite during grading, construction, and other post-development activities. The clean-up levels against which soil samples were compared (see Takach report and pages 55 and 56 of the November 17, 2006 OCs TMDLs technical staff report) are residential preliminary remediation goals (PRGs). EPA Region 9 makes the following statements about PRGs on their web site (<http://www.epa.gov/region09/waste/sfund/prg/faq.htm>):

*“PRGs (Preliminary Remediation Goals) for the Superfund/RCRA programs are risk-based concentrations, derived from standardized equations combining exposure information assumptions with EPA toxicity data. They are considered by the Agency to be protective for humans (including sensitive groups), over a lifetime. **However, PRGs are not always applicable to a particular site and do not address non-human health endpoints such as ecological impacts.**”* [emphasis added]

The PRGs used at MCAS Tustin are substantially higher than the TMDL sediment numeric targets (see table below), which were selected to protect the most sensitive beneficial uses in the watershed, including wildlife. Therefore, even though contaminated soils at the site were left at PRG concentrations, there still exists the potential for contaminants to migrate from the site due to erosion and transport via storm water runoff.

Contaminant	Residential PRG (µg/kg)	TMDL Sediment Numeric Target (µg/kg)
Chlordane	1600	4.5
DDD	2400	
DDE	1700	
DDT	1700	6.98 (as total DDT)
PCBs	3900	34.1
Toxaphene	440	0.1

As a specific example of this issue, six Installation Restoration Program (IRP) sites (i.e., sites with known contamination) were identified on MCAS Tustin during various site investigations. The primary contaminants at the sites were diesel fuel, oils, lubricants, cleaning solvents, gasoline, paint stripper, and battery acids. Bechtel National, Inc., summarized the magnitude of OC pesticides and PCBs in soil and groundwater that were

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

found at the base in their 1997 Draft Final Remedial Investigation Report (see Table 4-4 in the November 17, 2006 staff report, page 57).

No further action recommendations, in terms of OC pesticides or PCBs, were made for soils on IRP-3, IRP-5, IRP-12, IRP-13E, and IRP-16. At site IRP-12, some soils left in place had total DDT concentrations of around 1000 ppb; the TMDL numeric target for total DDT in soils is 6.98 ppb. As a result, OC pollutants left in place at these sites, even though they met the Navy's clean-up goals for base closure and transfer, could potentially become mobilized as the sites are developed for urban uses. If soils are eroded and discharged to surface waters from this site, adverse impacts to water quality may occur. Again, residential PRG cleanup goals do not consider human health or ecological impacts that could occur if soils are eroded and transported to surface waters.

With this said however, it is important to emphasize that the sediment numeric targets used in the recommended TMDLs are not intended to serve as "remediation goals" per se. The TMDLs regulate surface waterbodies and do not directly apply to soils that stay at MCAS Tustin. Where they migrate to an impaired waterbody subject to the TMDLs and become sediment, however, the numeric targets apply. The TMDLs accordingly do not specifically mandate more stringent cleanup levels for the organochlorine compounds in soil at MCAS Tustin. A tiered approach is appropriate: (1) BMPs must be employed to minimize the erosion and transport of soils that may contain organochlorine compounds off site to surface waters, and (2) depending on the effectiveness of the BMPs, some of the soils on these sites may require further remediation to ensure that construction and post-construction activities do not result in the erosion and transport of contaminated soils to surface waters in amounts that exceed the applicable load allocation. In their January 18, 2007 comments, the City has committed to requiring the deployment of effective sediment and erosion control BMPs to assure proper control of OCs loads in construction-related discharges. Provided that this commitment is met, then it is expected that monitoring would confirm that discharges from the MCAS Tustin site are not a significant source of organochlorine compound loading to surface waters and that discharges from the site would not cause or contribute to violations of the TMDLs.

**Comment #56**

The staff report acknowledges that there is no documented relationship between OCs and PCBs from MCAS Tustin and loading to San Diego Creek and Newport Bay. For example, page 53 notes that PCB loading "may" include PCBs originating from spills that occurred on MCAS Tustin in the past.

Furthermore, the Staff Report states that two studies are being conducted that "should lead to a better understanding of the relative pollutant contributions from different land uses" (page 51). Thus the Staff Report characterizes MCAS Tustin as a source of OCs, while at the same time acknowledging that MCAS Tustin may not be a source.

Implementation measures should be focused on identified sources, and the City should not be forced to expend resources to control pollutants from a site determined by the RWQCB to have been appropriately and fully remediated.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #56

Board staff believes that the City misrepresents the statements in the November 17, 2006 OCs TMDLs technical staff report. The technical staff report characterizes both MCAS Tustin and El Toro as potential sources of OC pollutants based on actual base documents, but acknowledges that further investigation is necessary. No other PCB spills in the San Diego Creek watershed have been documented other than those reported at these military bases. Table 4-4 (page 57 in the technical staff report) lists the reported concentrations of OC pesticides and PCBs detected in soil and groundwater at MCAS Tustin.

The purpose of the two studies mentioned on page 51 of the technical staff report is to link OC pollutant loads with specific land uses (agricultural, urban, construction, industrial, etc.). These studies and their purpose are described in more detail in Section 8.2 of the technical staff report (see study nos. 3 and 4 on pages 83 and 84 of the staff report). The study by the Southern California Coastal Water Research Project (SCCWRP) has been completed. A copy of their Technical Report No. 512 can be found at <http://www.sccwrp.org/pubs/techrpt.htm>. This peer-reviewed study found that of the land uses investigated (agricultural, commercial/industrial, residential, and construction—including completed grading and grading in progress), the average storm water concentration of total PCBs at construction sites was an order of magnitude greater than any other land use examined.

As stated previously (see Response #55), while the MCAS Tustin site may have been judged as being sufficiently remediated for the purposes of residential and commercial occupation by humans, that analysis did not consider that pollutants left in place could pose a threat to downstream water quality and beneficial uses if erosion and sediment transport to surface waters from these sites were to occur. Again, the City has committed to requiring effective erosion and sediment control measures to address this threat and to assure that “OCs loads in MCAS Tustin construction phrase runoff will not adversely affect implementation of load allocations...” (p. 8 of 11 of January 18, 2007 comments, second paragraph). Further, the City stated its intent to “exercise its development oversight and enforcement authority to assure proper preparation of a SWPPP, and selection, deployment and maintenance of construction BMPs, including sediment basins, to assure proper control of OCs loads in construction related discharges” (p. 8 of 11 of January 18, 2007 comments, third paragraph). Board staff commends the City’s affirmative commitments, which, as they are implemented as construction of the site proceeds, should assure compliance with the TMDLs.

Comment #57

In the prior City of Tustin scoping comment letter, on pages 7 and 8, we commented that the available evidence suggests that erosion of native sediments and channel beds, which is ongoing, and other sediment sources are likely to provide far more sediment to receiving waters than construction areas, which are temporary in nature and from which discharges are controlled by BMPs. Deployment of effective sediment and erosion control BMPs will be required during construction of MCAS Tustin pursuant to the requirements of the California State Water Resources Control Board (SWRCB) Water Quality Order 99-08-DWQ NPDES Permit for Storm Water Discharges from Construction Sites (NPDES No. CAS000002), as amended April 26, 2001 by SWRCB Resolution No. 2001-046 (“General

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Construction Permit”), and the Orange County Drainage Management Plan (“DAMP”). As a result, more information is needed prior to accepting the load allocations by type of land use in Tables 6-2a and 6-2b of the Staff Report or the weighted allocation percentages in Table 6-3.

**Response #57**

While it is acknowledged that erosion of sediments from open space and unimproved channels are important contributors of sediments to receiving waters, it is not known whether and at what levels OC pollutants may occur in soils in these areas. These potential sources could not be quantified during development of the OCs TMDLs, so these potential sources of OCs pollutants are to be evaluated during implementation. Load allocations may need to be revised based on the results of that investigation.

As the commenter is aware, the General Construction Permit (Order No. 99-08-DWQ), regulates storm water and non-storm water discharges from construction sites. This statewide general permit requires that best management practices (BMPs) be implemented that use best available technology economically achievable (i.e., BAT/BCT standard) to achieve an effective combination of erosion and sediment control. In 2005, Regional Board staff issued Notices of Violation (NOVs) for lack of an effective combination of erosion and sediment controls and other violations of the General Permit at two large construction sites in the City of Irvine. The NOVs stated that because of inadequate BMPs, sediment-laden storm water flowed into the storm drain system and adjacent drainages. Because these sites were being developed on lands previously in agricultural land use, it is likely that the transported sediments carried with them a certain amount of adsorbed legacy OC pesticides. Regional Board staff has similar concerns regarding construction activities on the former military bases where OC contaminants have been identified in soils. Task 4 of the recommended TMDL implementation plan (Section 4.b.3 of the proposed Basin Plan amendment) describes implementation actions that Regional Board staff believe are needed in order to address these concerns. As noted in the City’s comments and in prior responses (e.g., #55), the City has committed to require an effective BMP program and to assure proper control of OCs loads in construction related discharges. This is exactly what the TMDL implementation plan would require.

The waste load and load allocations shown in Tables 6-2a, 6-2b and 6-3 of the November 17, 2006 OCs TMDLs technical report are based on the best data available at the time the technical staff report was developed. This report clearly acknowledges that there are several areas of uncertainty in the OCs TMDLs and that is why these TMDLs have been developed as “phased” TMDLs (see Section 8.1 of the staff report). A phased TMDL is used when, for scheduling reasons, TMDLs need to be established despite significant data uncertainty and where the State expects that the loading capacity and allocation scheme will be revised in the near future as additional data are collected that will provide for more accurate TMDL calculations (USEPA, 2006). Accordingly, this approach provides time to conduct further monitoring and assessment, including data collection to fill informational gaps; development of site-specific, risk-based models to develop protective sediment and/or fish tissue targets; and assessment of open space and channel erosion as potential OCs sources. The results of these studies are expected to provide the technical basis for future modification of the TMDLs, WLAs, LAs, targets and/or other TMDL elements.

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Additional monitoring and assessment may also lead to delisting certain water body-pollutant combinations, should a finding of impairment no longer be supported.

In addition, the revised Basin Plan Amendment (BPA) provides the opportunity for development of a comprehensive work plan for the watershed that will address OC pollutants as well as other potential sources of toxicity in the watershed. The work plan approach, if pursued by the stakeholder, would include an early task to establish an Independent Advisory Panel (IAP) of objective, qualified scientists who will help to evaluate and address areas of remaining uncertainty in the OCs TMDLs, and will provide guidance and recommendations on the prioritization and appropriateness of the TMDL implementation tasks.

**Comment #58**

To further demonstrate that loadings of organochlorine compounds (“OCs”) in stormwater during construction on MCAS Tustin will not likely adversely affect implementation of proposed construction load allocations or beneficial uses so long as proper construction BMPs are deployed as required by the General Construction Permit and the DAMP, Geosyntec Consultants conducted an analysis to estimate the OCs loads that might be expected in stormwater runoff during the construction phase. See Tustin-Legacy Construction Loading Estimates for Organochlorine Compounds, prepared by Geosyntec Consultants, dated January 11, 2007 attached hereto and incorporated herein by reference (“the Geosyntec Report”).

**Response #58**

The Geosyntec report estimated loadings OC pollutants in construction site runoff using limited data to compare to the construction allocations in the OCs TMDLs. As the City acknowledges in Comment #59 below, better information is needed regarding OCs residues within the MCAS Tustin site, which are not as robust as desired due to high monitoring detection levels for compounds like toxaphene. The accuracy, applicability, and conservativeness of Geosyntec’s estimates of potential OC discharges from construction activities on the base cannot be judged without more information regarding the rainfall intensities and durations used, the location and distribution of the soil samples referenced, and a clearer picture of both how Geosyntec derived their numbers and of the actual contaminant concentrations in soils on the base. During extremely intense storms or storms of long duration, routine BMPs may not be effective in controlling sediment discharges; therefore, improvements to current BMPs and BMP implementation on construction sites are needed.

**Comment #59**

The Geosyntec analysis was based on very conservative assumptions and therefore overstates, and in the case of toxaphene “unrealistically” overstates, the anticipated OCs loads associated with construction phase runoff from MCAS Tustin. The analysis finds that, for all of the OCs except toxaphene, the projected loads were less than 3% of the proposed construction load allocation for the San Diego Creek watershed. While the estimated loads are a higher percentage of the load allocation for toxaphene (up to 12% using alternative calculation method 2), the report finds that this estimated load represents the upper bound for actual toxaphene load and likely substantially overstates the potential

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

load, since toxaphene was banned in 1990, and levels of the compound have steadily declined in fish tissue concentrations within the watershed.

Response #59

See Response #58.

Comment #60

The Geosyntec Report concludes that sediment loadings can be sufficiently limited as necessary to achieve load allocations through proper design, implementation, and maintenance of construction site BMPs required under the General Construction Permit and DAMP, including implementation of construction phase sediment basins.

The City requires, through CEQA mitigation measures (including mitigation measures set forth in the MCAS Tustin Specific Plan/Reuse Plan EIS/EIR and recently approved Addendum (April 2006) to the EIS/EIR in conjunction with an Amendment to the Specific Plan) and its water quality ordinance, the development of a Stormwater Pollution Prevention Plan (SWPPP) that incorporates appropriate erosion and sediment BMPs, including those discussed above. The City can, and will condition MCAS Tustin construction sites to implement the sediment basins as discussed in the Geosyntec Report. As a result, it has been demonstrated through modeling that construction and demolition activities within the MCAS Tustin site will not mobilize a 'reservoir' of organochlorine pollutants as stated in the Staff Report, and we request amendment of these conclusions in the Staff Report.

Response #60

See previous responses (Responses #54, #56, #57 and #58).

Comment #61

In addition to assuring that OCs loads in MCAS Tustin construction phase runoff will not adversely affect implementation of load allocations, the City engaged consultants to analyze the potential for estimated construction phase OCs loads to adversely affect beneficial uses. To determine whether the construction loadings of OCs identified in the Geosyntec Report would pose a hazard to human health or to wildlife, the most sensitive beneficial uses within the watershed, the attached Hazard Assessment of Runoff from Tustin Development Site, prepared by Dr. Jim Byard, an expert and toxicology consultant, dated January 11, 2007 ("Byard Report") was prepared. Dr. Byard analyzed the potential for the estimated OC's loads predicted in the Geosyntec Report to present a direct or indirect threat to human health or wildlife as a result of direct exposure or bioaccumulation. Dr. Byard's analysis concludes that runoff from the site does not pose a risk to human health or to wildlife, due to potential for direct or indirect exposure due to bioaccumulation.

Response #61

Regional Board staff reviewed the Geosyntec (see Response # 58) and Byard reports. For his wildlife hazard assessment, Dr. Byard does not compare the total DDT and chlordane concentrations estimated by Geosyntec (41 ppb and 0.6 ppb, respectively – note, the method Geosyntec used to adjust the surface soil data to current conditions is not addressed in their report) to the OCs TMDLs sediment numeric targets, but instead uses an

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

equilibrium partitioning (EqP) method to derive his sediment numeric target for DDT (45 ppb) and chlordane (90 ppb). Dr. Byard's targets are much higher than the TMDL numeric sediment targets for DDT (6.98 ppb) and chlordane (4.5 ppb).

The November 17, 2006 OCs TMDLs staff report discusses in detail in Section 3.2.3 why Regional Board staff did not elect to use the EqP method to derive the TMDL sediment targets (see pages 36 and 37 of the staff report). Some of the problems with the EqP method for calculating protective targets for sediment include 1) it assumes equilibrium conditions, which rarely exist in this watershed; 2) it assumes that aquatic organisms accumulate only pollutants derived from sediment porewater and does not allow for bioaccumulation from ingestion of sediment or other dietary intake (which is the primary route of exposure for most bioaccumulative compounds); 3) sediment targets calculated using this approach are extremely sensitive to the organic carbon fraction in sediment (the percent organic carbon in Bay sediments is extremely variable); and 4) there is substantial uncertainty regarding the octanol water and organic carbon partitioning coefficients ( $K_{ow}$  and  $K_{oc}$ , respectively) used in this approach.

Dr. Byard's human health hazard assessment also relies on the EqP method. Since the CTR human health criteria are already based on a lifetime cancer risk of  $10^{-6}$ , it is not clear why Dr. Byard uses the  $10^{-5}$  or  $10^{-4}$  cancer risk in his calculations. Regional Board staff's calculations of a sediment target for the protection of human health using the CTR human health criterion would be 28 ppb, not 265 ppb (Byard's  $10^{-5}$  cancer risk calculation) or 1,486 ppb (Byard's  $10^{-4}$  cancer risk calculation). However, for the reasons already stated, Regional Board staff elected not to use the EqP method to develop sediment numeric targets for the OCs TMDLs.

Dr. Byard does not provide his complete calculations in his report, his report and calculations have not been subject to peer review, as required by the State Listing Policy, and other commenters have suggested that Regional Board staff's numeric sediment targets are, in fact, not stringent enough to adequately protect sensitive species in the watershed, such as California Least Terns. Reliance on Dr. Byard's recommended targets would not be, in staff's view, sufficient to protect beneficial uses and, thus, would be inadequate to the purpose of the TMDLs. (See also Attachment C1 for responses to Dr. Byard's comments in the Flow Science, Inc. reports)

**Comment #62**

In light of the technical conclusions presented in the Geosyntec Report and the Byard Report, preparation of a SWPPP identifying best available sediment and erosion control Best Management Practices ("BMPs"), and proper implementation of those BMPs, including sediment basins, during construction (as required) provide appropriate assurance that the site will not cause or contribute to exceedances of water quality standards in Peters Canyon Wash or Upper Newport Bay, will not preclude implementation of load allocations, and will not adversely affect beneficial uses. As for MCAS Tustin construction projects, the City intends to exercise its development oversight and enforcement authority to assure proper preparation of a SWPPP, and selection, deployment and maintenance of construction BMPs, including sediment basins, to assure proper control of OCs loads in construction related discharges.



**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

**Response #62**

Regional Board staff appreciates the City's determination to ensure that OC pollutants in construction-related discharges are adequately controlled on MCAS Tustin.

**Comment #63**

To confirm the conclusions of the Geosyntec Report and the Byard Report, and to improve information regarding OCs residues within the MCAS Tustin site, which is not as robust as desired due to high monitoring detection levels for compounds like toxaphene, the City of Tustin has been informed that Tustin Legacy Partners (the master developer of the MCAS Tustin Specific Plan) plans to conduct and submit the results of baseline runoff monitoring for OCs that will further characterize OCs loads in runoff under existing conditions. By using finer detection limits to measure OCs residues than were used to collect the currently available data, the conclusions in the Geosyntec and Byard reports can be confirmed prior to commencement of additional construction within the master development site.

**Response #63**

Regional Board staff appreciates the City's and Tustin Legacy Partners efforts to assess the extent of OC pollutant contamination remaining at MCAS Tustin. Regional Board staff looks forward to reviewing the study results once they are completed. However, a study that also assesses OC pollutant concentrations in site soils prior to the start of construction activities would allow determination as to whether removal of contaminated soils prior to site grading would be more cost- and time-effective for prevention of OC pollutant migration offsite.

**Comment #64**

As discussed in the City of Tustin's July, 2005 comment letter during the CEQA scoping Process for the OCs TMDL, the Regional Board must comply with CEQA when amending its Basin Plan.

There are a number of impacts associated with the Amendment and its reasonably foreseeable implementation measures that must be analyzed pursuant to CEQA. Cal Pub. Res. Code § 21002; CEQA Guidelines §§ 15187; 15252; *Sierra Club v. Board of Forestry*, 7 Cal.4<sup>th</sup> 1215; *City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4<sup>th</sup> 1392. These measures include implementation of open space BMPs, increased dredging, and implementation of additional sediment control BMPs that go beyond large sediment basins. All of these reasonably foreseeable implementation measures are likely to result in potentially significant environmental impacts that CEQA requires be further analysis and consideration prior to the Regional Board's approval of the Basin Plan Amendment.

In our previous scoping comments submitted on July 5, 2005, we identified several measures for which the environmental impacts needed to be identified and analyzed in the substitute environmental document. Attachment B of the Staff Report is the Environmental Checklist. The checklist contains 2 and a half pages of explanation of the checklist answers in the categories "Less than Significant with Mitigation" and "Less than Significant." This cursory analysis of environmental impacts fails to meet CEQA standards.

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

The Staff Report attempts to defer analysis of certain environmental effects by stating that “any potential adverse environmental effects associated with TMDL implementation will be subject to project-specific CEQA analysis and certification.” Further, the Staff Report references that any large-scale dredging, “if pursued by the stakeholders as a method of compliance with these TMDLs could have adverse impacts on scenic vistas or the existing visual character of specific sites, such as Newport Bay” but “such impacts would be temporally limited and or could reasonably be mitigated by vegetative buffers and the like.”

The Environmental Checklist defers impact analysis, does not identify or discuss appropriate and feasible mitigation measures for implementation measures, and generally does not comply with CEQA requirements for functional equivalent analysis pursuant to certified regulatory programs. For those few measures where an impact is referenced, the Regional Board did not undertake a full impact analysis as required by CEQA. For example, focusing on the visual impacts of dredging, and not addressing the substantial potential impacts on biological resources, hydrology and water quality, ignores the full range of potential impacts due to dredging.

An adequate analysis of direct and indirect effects associated with proposed and reasonably foreseeable TMDL implementation measures, and the identification of all feasible and available mitigation measures is critical to the Regional Board’s consideration of an appropriate TMDL. In the absence of a proper CEQA analysis prior to adoption of the proposed TMDL, the Board cannot fulfill the duties incumbent upon it to consider all direct and indirect environmental impacts of the Amendment proposed for its adoption.

Response #64

See Response #51.

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**Chris Crompton, County of Orange  
Letter Dated August 23, 2007**

Comment #65

Section 4.b.3, Page 13 of the draft Basin Plan Amendment states that “Implementation of the Work Plan...will obviate the need for individual actions on the tasks in Table NB-OCs-13 by members of the Working Group.”

Table NB-OCs-13 states in footnote a that “The tasks and schedules identified in the Regional Board approved Work Plan developed by the Working Group shall govern implementation activities by members of the Working Group.”

We interpret these statements to mean:

- tasks described in the implementation plan should be considered, but may or may not be included in the final approved Work Plan;

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

- if tasks in the implementation plan are included in the final approved Work Plan, the actual task language may be different than as stated in the implementation plan of the Basin Plan Amendment;
- the final approved Work Plan may contain other tasks not currently described in the implementation plan;
- the final approved Work Plan, not the tasks as described in the implementation plan, will dictate the actions and time schedules required of the Working Group members, and therefore implementation of the Work Plan constitutes compliance with the TMDL during the Work Plan implementation period.

**Response #65**

These interpretations are correct. Note that the language in Section 4.b.3., page 28 (Task 7) has been revised to clarify expectations with respect to consideration of the implementation plan tasks. The relevant excerpt is shown below, with the added language underlined:

“It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 (except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements) must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal. In addition, consideration shall be given to the following: “

These changes were made in response to the request for clarification by other stakeholders.

**Comment #66**

The emphasis on physical and structural options within the draft Basin Plan Amendment and Substitute Environmental Document (dated July 25, 2007) does not preclude consideration of appropriate non-structural remedies, such as monitored natural attenuation and non-structural BMPs.

**Response #66**

The Regional Board cannot dictate the method or manner of compliance with requirements based on the TMDLs. Non-structural remedies can certainly be considered. Clearly, such remedies must be demonstrated to be effective and timely.

**Comment #67**

Task #4 of the implementation plan states that “additional BMPs, including enhanced BMPs, must be evaluated...” In addition to the flexibility to develop the work plan (as noted above), the use of the term “enhanced BMPs” does not require advanced treatment systems (ATS), given that the State Water Resources Control Board defines these two

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

terms differently and that implementation of ATS has the potential to introduce additional toxicity into the discharge.

**Response #67**

The Regional Board cannot dictate the method or manner of compliance with requirements based on the TMDLs. The proposed implementation plan requires the MS4 permittees to conduct an evaluation of BMPs, including enhanced BMPs, to determine those that may be effective in reducing the fine particulate discharges most likely to harbor organochlorine compounds. Language has been added to this task (Task 4 of the proposed implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3, page 23 and 24) to reflect the need to consider the potential adverse environmental consequences of implementation of enhanced BMPs.

The revised language is underlined in the excerpts shown below:

Page 23 excerpt: “(d) additional BMPs, including enhanced BMPs, must be evaluated to determine those that may be appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., BMPs effective in control of fine particulates) without significant adverse environmental effects (e.g., toxicity that might result from improper storage and/or application of polymers);”

Page 24 excerpt: The MS4 permittees shall conduct studies to evaluate BMPs that are most appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., fine particulates), including advanced treatment BMPs. The evaluation shall consider the potential for adverse environmental effects associated with implementation of each of the BMPs identified.

The proposed implementation plan requires the MS4 permittees to conduct the BMP evaluation in accordance with a plan and schedule approved by the Executive Officer. The BMP plan developed by the permittees on the basis of this evaluation must be implemented upon approval by the Executive Officer. Provided that adequate justification is provided to the Executive Officer, the approved plan would not necessarily include enhanced (advanced treatment) BMPs.

Regional Board has discussed with County staff the expectation that one or more tasks would be included in the Work Plan (Task 7 of the proposed implementation plan) to initiate early, on-the-ground action to reduce organochlorine compound discharges. Evaluation and improved implementation of BMPs, as shown necessary, appears to be one logical candidate for such early action.

**Comment #68**

Additionally, in reviewing the Substitute Environmental Document (SED) for the Organochlorine Compounds Total Maximum Daily Loads, San Diego Creek, Upper Newport Bay and Lower Newport Bay (dated July 25, 2007), the County of Orange submits the following comment:

**Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

- Implementation of non-structural BMPs, including monitored natural attenuation, should be considered as potential alternative actions. The current evaluations focus on structural remedies and do not consider the less environmentally invasive non-structural alternatives. Concentrations of the organochlorine compounds are decreasing in the watershed, as acknowledged by Regional Board staff in the November 17, 2006 Staff Report (pg. 81) and the draft Basin Plan Amendment (pg. 8). Additionally, due to the technical uncertainties, the November 17, 2006 Staff Report acknowledges that some pollutants may warrant delisting as additional monitoring is conducted (pg. 81), further supporting the consideration of the less invasive non-structural alternatives. Therefore, monitoring and evaluating such decreases needs to be considered in the SED to fully compare and understand the impact of the recommended action (implementation of the TMDL).

**Response #68**

The SED considers the impacts of the reasonably foreseeable methods of compliance, and takes a conservative approach in doing so, i.e., the environmental effects associated with the implementation of structural controls are, as the commentator suggests, likely to be more significant than those associated with monitoring natural attenuation. Data adequate to demonstrate that natural attenuation alone will be sufficient to prevent impairment due to organochlorine compounds in a timely manner are not available at the present time. If, as TMDL implementation progresses, through the Work Plan approach or otherwise, it can be demonstrated that natural attenuation will in fact suffice to achieve the purpose of the TMDLs, then the TMDLs/implementation plan can be revised accordingly. Further, additional investigation may demonstrate that delisting of one or more of the pollutant/waterbody combinations is appropriate, obviating the need for one or more TMDLs.

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***Tim Serlet, City of Tustin***

**Comment #69**

The City, as one of several stakeholders that have been participating in the Board's development of the TMDL, is concerned that the Regional Board is not giving due consideration to natural attenuation as a long term remedy and implementation measure. The Regional Board has acknowledged that "natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay" and notes that "[N]atural attenuation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations...." (Draft Basin Plan Amendment, p. 8). Moreover, outside experts retained by the stakeholders have confirmed that natural attenuation of organochlorines is occurring within the watershed. The conclusions of this analysis are highlighted in the August 23, 2007 letters sent under separate cover by other stakeholders, including the Great Park Corporation, City of Irvine, and other landowners within the watershed ("Stakeholder Letters").

***Attachment C5 – Response to Local Agency/Municipality Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The City also encourages the Regional Board to review U.S. EPA guidance on remediation strategies, which include Monitored Natural Recovery (“MNR”) to address contaminated sediment. (U.S. EPA, Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, December 2005, Chapter 4). The U.S. EPA recognizes MNR as a viable remediation strategy.

Based on the foregoing and for the reasons set forth in the other Stakeholder Letters, the City respectfully requests that the Regional Board consider natural attenuation as a viable long term solution and implementation measure to address organochlorines in the watershed.

Response #69

See Response #68.

**Attachment C6 - Response to Local Stakeholder Groups' Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Commenter/Affiliation	Page Number	Comment Numbers
Andrew R. Henderson, General Counsel <i>Building Industry Legal Defense Foundation (BILD)</i> Letter dated January 12, 2007 with attachments	2-22	1-28
Carollyn B. Lobell, Nossaman, Guthner, Knox & Elliott, LLP for: <i>Construction Industry Coalition on Water Quality (CICWQ), and the California Farm Bureau Federation</i> Letter dated January 12, 2007 with attachment	22-43	29-52
Robert J. Caustin <i>Defend the Bay and Natural Resources Defense Council (NRDC)</i> Letter dated January 16, 2007	43-44	52-54
Mary Lynn K. Coffee Nossaman, Guthner, Knox & Elliott, LLP for: <i>Orange County Great Park Corp./Heritage Fields LLC.</i> Letter dated January 12, 2007 with attachments	44-51	52-62
Dr. John Skinner <i>Stop Polluting Our Newport</i> Electronic mail dated January 13, 2007 Electronic mail dated February 9, 2007	51-54	63-66 66-68
Paul N. Singarella Lathem & Watkins LLP for: <i>The Irvine Company</i> Letter dated August 23, 2007 with attachments	54-55	69-71
Carollyn B. Lobell, Nossaman, Guthner, Knox & Elliott, LLP for: <i>Lennar Heritage Fields and Shea Tustin Legacy Community Partners</i> Letter dated August 23, 2007	55-58	72-77

**Attachment C6 - Response to Local Stakeholder Groups' Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

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**Andrew R. Henderson**  
**Building Industry Legal Defense Foundation**

Comment #1

It has come to our attention that the Draft TMDL prepared by the Santa Ana Regional Water Quality Control Board ("RWQCB") is significantly flawed principally because of reliance by RWQCB Staff ("Staff") on demonstrably poor science. If adopted in its current form, the Draft TMDL will impose extraordinary, and ultimately unnecessary, expense on the local building industry within the region subject to the TMDL – further exacerbating the housing affordability issues facing prospective homeowners in the region and setting a dangerous precedent for TMDLs elsewhere in the state.

Response #1

In contrast to the assertion that the proposed organochlorine compounds TMDLs are not scientifically defensible, the scientific validity of the TMDLs has been confirmed by three independent expert peer reviewers (see Peer Review Letters, Attachment F and Peer Review Comments and Responses, Attachment C3), State Water Board staff, and USEPA Region 9 staff. In a letter dated January 11, 2007, to Board Chair Beswick (Attachment G), the USEPA indicated its support for the proposed TMDLs, explicitly stating that they meet all regulatory requirements and will be approvable upon submittal to EPA. As stated by many of the commenters, scientific defensibility is a fundamental TMDL regulatory requirement.

The commenter's assertion appears to rely on the issues raised by Dr. James Byard concerning the numeric targets used in the proposed TMDLs. In their January 11, 2007 letter (Attachment G), EPA specifically stated that the selected numeric targets are appropriate, and noted that they have been widely used in California to address impacts from bioaccumulative toxic pollutants.

The assertions that the targets rely on flawed and/or outdated data and incorrect analysis presented in the literature, and that the target/TMDLs are thus not scientifically defensible, are based primarily on the opinion of one commenter, Dr. James Byard, and the Flow Science reports based on his commentaries. The "errors" asserted by Dr. Byard and assumed in the Flow Science reports are not errors in the underlying data or in the database but rather reflect differences in the interpretation of the underlying data, differences in the analysis of those data (see Dr. Donald D. MacDonald, MESL, letter dated February 19, 2007, Attachment E), and/or, perhaps most importantly, differences in the selection of the level of protection that ought to be provided to humans and wildlife (see Dr. Katherine T. Zeeman, FWS, electronic mail dated February 7, 2007 and Dr. Timothy Kubiak, FWS, electronic mail dated February 15, 2007, Attachment E).

Dr. Byard's arguments are based on the assumption that targets should be set based on the threshold at which adverse impacts to the biota are observable. However, this approach does not take into account the potential adverse impacts of the organochlorine pollutants on species that may be more sensitive than those assessed in formulating



***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

observable effects levels. Reliance on Dr. Byard's recommended targets would not be, in staff's view, sufficient to protect beneficial uses and thus would be inadequate to the purpose of the TMDLs. Board staff relied on targets at which observable effects would be expected to occur only rarely, an approach that is consistent with the purpose of the TMDLs to achieve and protect water quality standards.

Board staff explicitly recognized the uncertainty associated with the recommended targets and included, as part of the proposed implementation plan, special site-specific studies designed to provide data with which to refine the sediment and tissue targets. (See November 17, 2006 OCs TMDLs technical staff report, Section 8.3.9; see also Attachment 2 to Resolution No. R8-2007-0024, 4.b.3, Task 9.) Revisions to the OCs TMDLs Basin Plan Amendment (BPA) (Attachment 2 to Resolution No. R8-2007-0024) also include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks, including monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. An Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The development and implementation of a comprehensive, watershed-wide work plan (Attachment 2 to Resolution No. R8-2007-0024, 4.b.3, Task 7), if pursued by the stakeholders, will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence at a public meeting) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned.

**Comment #2**

We are very concerned that Staff has not responded to previously-provided technical and scientific comment on the studies being relied upon in the Draft TMDL. At the December 1, 2006 Public Workshop, we understand the RWQCB board expressly directed Staff to undertake a good faith effort to address the numerous errors in the Draft TMDL. BILD expects and acknowledges that such an effort will take time. If, through this anticipated process, the Staff were to correct the many errors in the TMDL, BILD may determine that its involvement in this matter is no longer necessary. However, if the TMDL is not materially improved, BILD requests additional time to assess the full legal and economic implications of the Draft TMDL.

**Response #2**

As confirmed by the December 1, 2006 Public Workshop transcript (Attachment H), RWQCB members did not acknowledge "numerous errors" in the OCs TMDLs or "direct" staff to address them at the December 1, 2006 Public Workshop. Rather, Board members expressed concern at the obvious lack of scientific agreement on the numeric targets between Board staff and the stakeholders. Acting Chair Withers requested that both the stakeholders and Board staff continue to work together and provide Board members with a decisional matrix that would compare/contrast the proposed TMDL numeric targets with the stakeholders' proposed numeric targets to help to clarify the remaining unresolved issues. Board member Gallarda seconded this suggestion with the request that the stakeholders develop the matrix and then submit it to Board staff for review and comment (BILD should refer to the December 1, 2006 Public Workshop transcripts in Attachment H). The

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

decisional matrix was finalized and submitted to the Board members at the April 20, 2007 Board meeting. A copy of the decisional matrix is included in Attachment E to the April 20, 2007 supplemental staff report which can be downloaded from our web site at [http://www.waterboards.ca.gov/santaana/pdf/04-20-07/04-20-2007\\_item\\_17.pdf](http://www.waterboards.ca.gov/santaana/pdf/04-20-07/04-20-2007_item_17.pdf).

The technical reports and scientific commentary that BILD is apparently referring to are based primarily on the opinion of Dr. James Byard and the Flow Science reports based on his commentaries (see Attachment D). Board staff received the Flow Science reports on November 23, just two days prior to the Thanksgiving holiday, which did not provide staff with sufficient time to review and respond to these reports at the December 1, 2006 Public Workshop. Staff have since responded to these reports and Dr. Byard's assertions in writing (see responses to Flow Science, Inc. reports in Attachment C1). Further, it is important to emphasize that Dr. Byard, as a member of the Technical Advisory Committee (TAC) convened by Board staff to review and comment on the proposed TMDLs as they were being developed, presented the same comments during TAC meetings. Board staff responded orally to these comments during those meetings.

The "errors" asserted by Dr. Byard and assumed in the Flow Science reports are not errors in the underlying data or in the database but rather reflect differences in the interpretation of the underlying data, differences in the analysis of those data, and/or, perhaps most importantly, differences in the selection of the level of protection that ought to be provided to humans and wildlife. Dr. Byard's opinions have not been subject to peer review and scientific validation as required by California's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (2004 State Listing Policy). In contrast to Dr. Byard's work, the Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by the State Water Resources Control Board and USEPA Region IX staff.

**Comment #3**

It is BILD's understanding that the RWQCB is accepting comments "up to and including the date of the adoption hearing," with such hearing currently scheduled for March 2, 2007. Nevertheless and per Staff's request, BILD is submitting the following comments by January 12, 2007 to facilitate the Staff's preparation of: (1) the Draft TMDL and associated Basin Plan Amendment; (2) the notice document for the March 2, 2007 public hearing; and (3) the agenda package that will be submitted to the RWQCB board. We will expand on these comments and raise additional issues, as appropriate, at future administrative proceedings on this topic. We do not waive and instead specifically reserve our right and opportunity to make additional comments up to and including the date of the adoption hearing.

**Response #3**

Comments on the OCs TMDLs can be submitted up to the time of Regional Board consideration of the TMDL Basin Plan amendment at a public hearing. The public hearing date has been rescheduled to September 7, 2007, so comments on the OCs TMDLs can be submitted until then. Written responses to comments submitted at least two weeks prior to the hearing date will be provided.

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Comment #4

The TMDL rulemaking presents the RWQCB with an important and challenging task. There are few TMDLs setting sediment and fish targets for legacy compounds in California, and few across the country. Given the magnitude of this rulemaking, it is critical that the RWQCB take the time to ensure that the TMDL is scientifically and legally defensible.

Response #4

The OCs TMDLs have been found to be scientifically defensible by the peer reviewers, SWRCB and USEPA staff. TMDLs for organochlorine compounds have been adopted by 20 states (including California) and the District of Columbia. Since 2006, EPA has approved 322 TMDLs for DDT and its metabolites, 117 TMDLs for Chlordane, 169 TMDLs for Toxaphene, and 255 TMDLs for PCBs

([http://iaspub.epa.gov/waters/national\\_rept.control#TPOL](http://iaspub.epa.gov/waters/national_rept.control#TPOL)).

Comment #5

*The TMDL should be based solely on sound science.* The RWQCB needs to ensure that the science underlying the TMDL is sound and correct. It manifestly is a scientific exercise to determine a TMDL correctly. The current proposal so fundamentally misapprehends the Loading Capacity of the subject waterbodies, as reflected in the grossly and erroneously low target values, that it arguably is not a TMDL at all, which requires the maximum pollutant load that can be assimilated to be determined. The targets and assimilative capacity analyses are basically useless, given that they are rife with error.

Response #5

See Response #1.

Comment #6

*The TMDL should comply with all legal requirements.* Not only must the TMDL be scientifically sound, it also must be legally defensible. Chiefly among them, a legal requirement for proceeding with a TMDL is that the agency has established the proper technical conditions, which manifestly are absent in this case. This legal failure leaves the agency with no choice but to rectify the scientific basis for its proposed action, or its rule will be arbitrary and capricious, and otherwise contrary to law. The agency has not provided the analytical framework for a valid rule, and has not explained how its findings and proposed rule are logically supported by the underlying facts, violating the California Supreme Court's *Topanga* rule. The RWQCB must comply with the legal requirements set forth herein.

Response #6

The commenter's assertion that the TMDLs must present the rigorous findings of the kind contemplated by the California Supreme Court in the seminal case, *Topanga Assn. for a Scenic Comm. v. County of Los Angeles* (1974) 11 Cal.3d 506, is erroneous. *Topanga* applies to quasi-adjudicatory actions reviewable under Code of Civil Procedure Section 1094.5. The adoption of a TMDL via amendment of a Basin Plan, by contrast, is a quasi-legislative action. (*City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392, 1409.) Formal findings are therefore not required. (*Shapell Industries, Inc., v. Governing Board* (1991) 1 Cal.App.4th 218, 230.)

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

The assertions that the proposed TMDL targets are erroneous and scientifically unjustified are not defensible and are based primarily on the opinion of one commenter, Dr. James Byard. Dr. Byard's opinions have not been subject to peer review and scientific validation as required by California's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (2004 State Listing Policy). In contrast to Dr. Byard's work, the Organochlorine Compounds TMDLs have been judged to be scientifically defensible through the peer review process and by the State Water Resources Control Board and USEPA Region IX staff. Section 6.1.3 of the State Listing Policy presents the State's approach for determining compliance with narrative water quality objectives. The Policy lays out a procedure for addressing narrative standards such as apply to the OCs TMDLs. In order to avoid making arbitrary and capricious decisions on narrative standards attainment, the procedures specified in Section 6.1.3 of the Listing Policy were closely adhered to by Regional Board staff in their impairment assessment and selection of numeric targets.

Regional Board staff used the following decision criteria to select numeric targets for the OCs TMDLs:

The targets must be:

- Scientifically defensible
  - Peer-reviewed (required by the State Listing Policy)
- Conservative
  - Address uncertainty
  - Must use no or low effect level assumptions, not levels above which adverse effects are expected
- Approvable
  - By SWRCB and USEPA

The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets, loads and allocations as new information becomes available.

**Comment #7**

*The TMDL program should consider both environmental and economic impacts and balance them with the benefits of the program.* The RWQCB is required to engage in a balancing process when determining what TMDL and implementation measures are necessary and appropriate, taking into consideration a variety of factors including anticipated environmental benefits and economic considerations. The proposed TMDL fails to address seriously what specific implementation measures will be required, and of which entities, and at what cost, assure compliance with the TMDL allocations. This is a fundamental failing that must be addressed. The RWQCB has not examined or defined closely what implementation of the Draft TMDL really will entail, what alternative approaches there are, how much sediment will fail to comply with the Draft TMDL, the fate and transport of such sediments, and how much it will cost to return these sediments to compliance (which itself requires detailed articulation and specificity).

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #7**

The commenter asserts that the Regional Board is required to “analyze economic impacts” of the TMDL and, in comment #18 (see below), refers specifically to Water Code Section 13241. Section 13241 applies to the adoption of water quality objectives. Water quality objectives are analogous to water quality standards, which are submitted to US EPA for approval in accordance with Section 303(c) of the Clean Water Act. TMDLs are not water quality standards, but instead are submitted to US EPA for review and approval under Section 303(d) of the Clean Water Act. TMDLs are, in fact, components of the implementation program for the Basin Plan, which, as the commenter acknowledges, is required by Section 13242 of the Water Code. The implementation program specifies actions necessary to achieve water quality objectives. A TMDL is a mechanism to improve the quality of an impaired water body to a level that meets water quality objectives. Thus, a TMDL is a mechanism to achieve water quality objectives and is not a water quality objective itself. As TMDLs are not “water quality objectives,” the Regional Board is not required to analyze the factors listed in section 13241 in advance of adopting the OCs TMDLs.

That said, however, the need to consider economics when developing the proposed Basin Plan amendment is recognized. The documentation for these TMDLs thoroughly addresses economic concerns. The November 17, 2006 organochlorine compounds TMDLs technical report includes economic considerations (see Section 9.0). In addition, Board staff prepared and distributed a Substitute Environmental Document (July 25, 2007) (Attachment B to the September 7, 2007 supplemental staff report), fulfilling applicable CEQA requirements for the consideration of potential environmental impacts associated with implementation of the proposed TMDLs, mitigation measures and alternatives. Economics were taken into consideration in this evaluation. In particular, the SED takes into account cost when identifying reasonably foreseeable methods of compliance with the TMDLs.

The economic implications of the TMDLs are also implicitly recognized in the proposed phased implementation plan. Revisions to the proposed OCs TMDLs implementation plan include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. An Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The development and implementation of a comprehensive, watershed-wide work plan (Attachment 2 to Resolution No. R8-2007-0024, 4.b.3., Task 7), if pursued by the stakeholders, will allow the stakeholders to evaluate and potentially revise (with Regional Board concurrence at a public hearing) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned. The overall effect of this comprehensive and integrated approach is expected to be an expeditious, fair and resource-efficient method of resolving organochlorine compound and other water quality problems in the watershed.

While economic considerations must be taken into account in basin planning, such as the adoption of an amendment to incorporate the proposed TMDLs, it should be noted that

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

there is no statutory *requirement* for a formal cost-benefit analysis (see Section 9.0 of the November 17, 2006 OCs TMDLs technical staff report).

The parties responsible for implementation of each of the tasks are identified in the discussion of each of the tasks in the proposed implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3.).

Finally, it is worthwhile to point out that in the absence of approval of the proposed TMDLs and implementation plan, the Regional Board is required to implement the organochlorine compounds TMDLs established by the U.S. EPA. The U.S. EPA has not developed an implementation plan for their TMDLs, nor is the agency required to do so.. The result is that there is no schedule for compliance with the U.S. EPA TMDLs; the Regional Board would be obligated to require immediate compliance. Since immediate compliance with the U.S. EPA TMDLs is likely infeasible, the Regional Board would be required to compel compliance with permit limitations implementing the TMDLs in accordance with a schedule(s) specified in an enforcement order (e.g., cease and desist order). Such orders do not cure violations, but instead place the discharger on a schedule to achieve compliance. Until compliance is achieved, dischargers are potentially subject to further enforcement actions, including citizen suits. The comparative environmental and economic effects of implementing the U.S. EPA TMDLs rather than those proposed by Board staff, are discussed in the Substitute Environmental Document (see sections 7.1 and 7.2).

Comment #8

The Draft TMDL proposed sediment numeric thresholds contain several fundamental defects. The RWQCB is proposing thresholds that (1) do not reflect causal relationships between the specific pollutants and toxicity, (2) ignore material contrary evidence demonstrating that organochlorines do not cause toxicity at values much higher than the TMDL values, and (3) rely on statistical artifice to drive the thresholds to arbitrarily low values.

Response #8

The assertions that Board staff uncritically and selectively utilized available data and employed statistical artifice to derive the proposed numeric targets are simply unfounded. Board staff critically reviewed all available data and peer-reviewed guidelines in making target and TMDL recommendations. This decision-making process is discussed in detail in Section 3.0 of the November 17, 2006 OCs TMDLs technical staff report. The argument that data were selectively utilized appears to result from a difference of opinion regarding the level of protection that ought to be provided to humans and wildlife (i.e., the selection of numeric targets at which no observable negative effects are expected versus numeric targets at or close to the threshold of observable impacts). While the commenters assume that the latter choice is appropriate, Board staff believes that the first, more conservative approach is necessary and appropriate to protect beneficial uses and achieve the legal mandate of the TMDLs. Board staff's recommended target selection approach has been confirmed by the State Water Resources Control Board (SWRCB) and the United States Environmental Protection Agency (USEPA). In deriving the targets, Board staff relied not on statistical artifice but on peer-reviewed, published guidelines that have been used elsewhere in SWRCB and USEPA-approved TMDLs.

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

The argument that the proposed sediment numeric targets do not reflect causal relationships between specific pollutants and toxicity is again based on the assumption that the targets should be based on observable effects thresholds. As discussed above, Board staff rejects that view as inconsistent with the fundamental purpose of the TMDLs. Threshold Effects Levels (TELs) were specifically selected as sediment numeric targets for protection of wildlife because they directly link sediment concentrations to biologic effects (see Section 3.4, page 40 of the November 17, 2006 OCs TMDLs technical staff report).

Further, there is no compelling evidence to support the assertion that current organochlorine compounds levels in the watershed are below levels that cause toxic effects. Even if toxic effects are not “observable”, that does not mean that such effects are not present. The impairment assessments conducted by Regional Board staff, USEPA (2002) and the SWRCB (in consideration of the 2006 Clean Water Act Section 303(d) list of impaired waters) all found impairment due to DDT and other identified organochlorine compounds in Newport Bay and/or its tributary waters. These findings necessitate the development and implementation of TMDLs to address the sources of impairment.

**Comment #9**

In establishing TMDL target values, the RWQCB appears to be relying on the mere presence of chemicals at sites to conclude that those specific pollutants cause toxicity in sediments at those sites, even when empirical evidence directly contradict this conclusion. A study conducted in Newport Bay (Bay et al., 2004) indicates that PCBs and DDT are not the cause of observed toxicity, even though these chemicals were detected in the sediments. The RWQCB should consider and rationalize all studies, including those indicating that the benthic community was not degraded when compounds such as DDT and PCBs were present at levels far higher than the Draft TMDL’s proposed thresholds.

**Response #9**

The following is taken directly from the OCs TMDLs impairment assessment (Appendix B of the November 17, 2006 technical staff report):

**F. TOXICITY AND BENTHIC COMMUNITY DEGRADATION – UPPER NEWPORT BAY**

1. Bay Protection and Toxic Cleanup Program (BPTCP) (1994-1997). Six sites sampled in Upper Newport Bay (total of 8 samples; n=8). 2/8 sediment samples were toxic to amphipods (*Rhepoxynius*). 6/6 sites sampled showed porewater (100%) toxicity to purple urchin larval development. Spearman Rank Correlation testing showed significant correlation between amphipod toxicity and urchin development toxicity, and chemistry, for total chlordane, total PCB, and DDTs. 3/8 sites showed transitional benthic communities (benthic index of 0.31-0.6), intermediate between degraded and undegraded communities. The benthic indices for Upper Newport Bay were significantly correlated with DDE [emphasis added].
2. SCCWRP Sediment Toxicity Study (2004; [Bay et al., 2004]) - In September 2000, reduced amphipod survival was measured in sediments at 3 out of 5 of the sites sampled. One site had 99% mortality. Sediment-water interface was

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

not toxic to sea urchin fertilization, and was toxic to sea urchin development at 1 site. In May 2001, 3 out of 5 sites showed sediment toxicity to amphipods, and the sediment-water interface was toxic to sea urchin fertilization at 2 sites. The TIE concluded that the primary toxicant was likely nonpolar organic pollutants. While concentrations of DDTs, chlordane and PCBs were not likely to be high enough to independently result in toxicity, there is no evidence to conclude that these pollutants did not contribute to the toxicity that was observed. There was a statistically significant relationship between concentration of total DDT and amphipod survival [emphasis added].

Comment #10

The numbers proposed by the RWQCB appear to be erroneous and scientifically unjustified. It appears that the RWQCB derived exceedingly low values for the proposed TMDLs by ignoring critical evidence that directly contradicts the Draft TMDL's conclusion that chemicals at these levels cause sediment toxicity. Data from Newport Bay that the Regional Board used to support the DDT and PCB thresholds show that PCBs and DDT were merely present, or co-located, along with other compounds in Newport Bay. Numerous studies, including the ones cited below [Bay et al., 2004; Lee et al., 2001; Lee and Taylor, 2001], indicate that (1) other compounds or factors are likely responsible for any observed toxicity; (2) the benthic community is not impaired when exposed to levels that are considerably higher than the Draft TMDL's proposed thresholds; and (3) there is no "dose-response" relationship demonstrating that toxic effects in the relevant benthic populations increased with increasing levels of exposure to the compounds under investigation.

Response #10

See Response #9.

Comment #11

Bay *et al.* (2004) found evidence of acute toxicity in Newport Bay sediment but noted that sediment toxicity were not correlated with concentrations of DDTs, PCBs, or PAHs, but rather to unmeasured organic compounds. Lee *et al.* (2001) found toxicity related to urban stormwater runoff present in Newport Bay, but that the cause of the toxicity is organophosphate pesticides. Lee and Taylor (2001) also indicated that pyrethroid pesticides should be investigated further as a potential source of toxicity in the Bay.

Response #11

See Response #9. Regional Board staff agree that it is not likely that these organochlorine compounds are the source of acute toxicity and that further studies should be conducted to determine the source of acute toxicity in the Bay. Regional Board staff's impairment assessment (see "2.0 Problem Statement" in the November 17, 2006 technical (SARWQCB 2006)) does not rely on findings that DDT or other organochlorine compounds are the cause of acute toxicity. However, while the OC pollutants may not be the source of the acute toxicity observed in bay sediments, they are continuing to bioaccumulate in the bay food web at concentrations that may be causing indirect, long term chronic effects in fish and wildlife (see US Fish and Wildlife Service comment letter dated February 28, 2007, Attachment G). This type of impairment must be addressed by the TMDLs.



***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #12

A literature review about DDE concentrations in the tissue of key wildlife species, trends in such DDE concentrations, and links between DDE tissue concentrations and reproductive success to evaluate potential chronic toxicity in sediment from Newport Bay indicate that relevant wildlife populations are not currently exposed to levels of DDE in Newport Bay that are known to cause chronic toxicity, and that expected continuing declines in DDE concentrations in the environment make it highly unlikely that DDE concentrations in wildlife tissue will increase from these nontoxic levels in the future.

Response #12

Comment #12 appears to be referring to the Flow Science, Inc. November 20, 2006 report titled, "DDT Analysis for the Newport Bay Watershed", which includes commentaries on DDT effects in birds by Dr. James Byard and DDT effects in marine mammals by Dr. Ronald Tjeerdema. Regional Board staff has responded to the many assertions made in these reports and refer BILD to Attachment C1.

In short, there is no compelling evidence to support the Flow Science report assertion that "current DDT levels in the watershed are below levels that cause toxic effects". In contrast, staff of the United States Fish and Wildlife Service (USFWS) concluded in their comment letter on the November 17, 2006 OCs TMDLs technical report (see comment letter dated February 28, 2007, Attachment G) that "...DDTr [total DDT] is a potential contaminant of concern for avian species that rely on benthic invertebrates from Newport Bay for food...and that maximum and mean concentrations of DDTr exceed dietary levels of concern for both small and medium-size piscivores [fish-eating birds]. Therefore, we support the determination by Regional Board staff that TMDLs are warranted for DDTr in Newport Bay".

Additionally, impairment assessments conducted by Regional Board staff, USEPA (2002) and the State Board (in consideration of the 2006 Clean Water Act Section 303(d) list of impaired waters) all found impairment due to DDT and other identified organochlorine compounds in Newport Bay and/or its tributary waters. These findings necessitate the development and implementation of TMDLs to address the sources of impairment. The TMDLs recommended by Regional Board staff employ a phased approach and extended compliance schedule to allow for future revision and refinement of the TMDLs if warranted by further investigation. This may include future delisting of one or more pollutant/waterbody combinations if evidence collected during implementation of the TMDLs provides adequate justification for such action.

Comment #13

It is our understanding that the RWQCB nonetheless is using sediment chemistry data from Newport Bay to develop sediment thresholds used to conclude without evidence that DDT and PCBs cause toxicity. Moreover, several studies presented relatively high levels of DDT and PCBs above the Draft TMDL's proposed thresholds, yet no toxicity was observed. The existence of such contradictory data noted above should cause the RWQCB to reconsider whether its thresholds are supportable by scientific evidence.

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Response #13

See Responses #9 and 11.

Comment #14

Donald MacDonald was deposed in a lawsuit by the United States (Case No. CV 90 3122 in the Central District of California) in which the government was trying to recover damages for alleged “injuries” to natural resources by establishing that the concentrations of DDT and PCBs in the sediments were sufficiently high to be toxic to invertebrates living in the sediments (e.g., worms, shrimp, sea urchins). For this task, NOAA hired Mr. MacDonald, who is a statistician rather than a scientist with any training in what levels of chemicals cause toxicity.

The government purported to measure the toxicity of the Palos Verdes Shelf sediments by comparing DDT concentrations to supposed threshold levels (“sediment effect concentrations” or “SECs”) derived by Mr. MacDonald. Mr. MacDonald derived threshold concentrations of DDT and PCBs in the sediments above which he believed sediment-dwelling organisms would be injured relying only on his literature review of studies conducted by others which were not geographically specific to the Palos Verdes Shelf, and therefore should be interpreted to apply to the Southern California Bight. His SECs were many times higher than his threshold effects levels (“TELs”) which calls into question the applicability of his TELs to the Southern California Bight. Mr. MacDonald’s SECs were additionally derived in a totally non-scientific and even misleading manner, as he misused selected data from various studies.

Mr. MacDonald professed in his report to have used the data from all relevant studies to determine that sediments with concentrations of DDT over 7.15 parts per million are toxic to sediment-dwelling organisms. Mr. MacDonald derived this threshold without taking into account the results of a study prepared by EVS Consultants, one of the government’s former experts in the case. EVS’s study was conducted on sediments and organisms from the Palos Verdes Shelf and showed no toxic effect from DDT concentrations as high as 267 parts per million. Mr. MacDonald’s literature survey did not even try to isolate the impact of DDT and PCBs from that of other contaminants present in the sediments. Other studies showed a threshold for toxicity of DDT and PCBs that was several times higher than Mr. MacDonald’s SEC values. Moreover, Mr. MacDonald’s SECs are only screening devices that cannot be used to determine whether sediments are toxic to invertebrates. Mr. MacDonald’s reliance on sediment studies where the presence of various contaminants other than DDT and PCBs confounded the analysis, made cause and effect conclusions impossible. Indeed, Mr. MacDonald admitted that he was simply drawing associations between pollutants and observed toxic effects, and not establishing a cause and effect. All of these fundamental problems illustrate that Mr. MacDonald’s work and his SEC values are unreliable, and any reliance on Mr. MacDonald by RWQCB in establishing its Draft TMDL is scientifically unsound.

Response #14

The following is Dr. MacDonald’s response to the assertions made by BILD in Comment #6 (see also Attachment E, MacDonald Environmental Sciences Ltd. (MESL), letter dated February 19, 2007):

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

“On January 12, 2007, A.R. Henderson, General Counsel for the Building Industry Legal Defense Fund, submitted a letter to Dr. K.L. Rose regarding the TMDLs for organochlorine compounds for San Diego Creek and Newport Bay. While I have not conducted a comprehensive review of this submission, I have noted a number of errors in fact that ought to be corrected for the record, including:

- Mr. Henderson indicated that I am a statistician rather than a scientist with any training in what levels of chemicals cause toxicity. This statement is false. In fact, I am an aquatic biologist, who specializes in ecological risk assessment and natural resource damage assessment in aquatic ecosystems. I am trained and have substantial experience in determining what levels of chemicals cause toxicity to aquatic organisms.
- Mr. Henderson indicated that the SECs that were derived to support a natural resource damage assessment of the Palos Verdes shelf relied on data from the Southern California Bight and, hence should be interpreted to apply to the Southern California Bight. This statement is correct; the SECs are intended to apply to the Southern California Bight.
- Mr. Henderson indicated that, because the SECs for the Southern California Bight were higher than the TELs derived previously, the applicability of the TELs to the Southern California Bight is in question. This statement is nonsense. The TELs and SECs are intended to serve two very different purposes. More specifically, the TELs define the concentrations of DDTs below which adverse effects on sediment-dwelling organisms are unlikely to be observed. In contrast, the SECs are intended to define the concentrations of DDTs above which adverse effects on sediment-dwelling organisms are likely to be frequently observed. That is, the SECs are intended to define toxicity thresholds of DDTs, while the TELs are intended to be conservative SQGs that are highly protective of the benthic community.
- Mr. Henderson indicated that SECs were derived in a non-scientific and even misleading manner, as selected data from various studies were used. This statement is false and defamatory. The SECs were intended to define the toxicity thresholds of PCBs and DDTs in sediments from the Southern California Bight. To achieve that goal, we identified, acquired, and evaluated data from a substantial number of studies that had been conducted within the study area and that were available to us (i.e., through searches of the literature). I understand that the EVS study referred to by Mr. Henderson was conducted for the government; however it was not made available to us. Therefore, we could not use it or refer to it in our report.
- Mr. Henderson indicated that failure to isolate the impact of DDT and PCBs from that of other contaminants present in the sediments represents a “fatal flaw” of the work. This comment clearly demonstrates Mr. Hendersons’ lack of understanding of the science and the rationale for deriving the SECs. Our evaluation of the toxic effects of DDTs and PCBs in sediments on the Palos Verdes shelf was intentionally designed to determine the toxicity thresholds of these substances when they occurred in complex mixtures with other contaminants in these sediments. In contrast to Mr. Hendersons’ assertion, this represents one of the strengths of the study that we conducted.

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Collectively, the misinterpretations and misunderstandings of the underlying science render meaningless Mr. Hendersons' comments on the validity and applicability of the various SQGs for DDTs."

**Comment #15**

Taken as a whole, the Draft TMDL, if adopted, will result in costly follow-up studies, source control efforts, or even sediment remediation to abate sediment effects present at levels that pose no appreciable risk, with the likely result of little or no progress toward the desired TMDL. Costs to the regulated community for these studies alone, which in and of themselves will result in no cleanup or environmental improvement, could easily be millions of dollars. Moreover, given the absence of any discussion regarding costs of implementation, BILD is concerned that there are additional substantial, yet largely unexamined, significant costs associated with the Draft TMDL. Such costs are unwarranted by any reasonable assessment of potential impacts to the benthic community, human health or wildlife.

**Response #15**

Assessments of impairment have been conducted by the USEPA, State Board staff and Regional Board staff. All concluded that there is impairment due to one or more organochlorine compounds in San Diego Creek, Upper Newport Bay and Lower Newport Bay. TMDLs must be developed and implemented to address this impairment. The economic implications of the TMDLs have been taken into consideration. (See also Response #7). The November 17, 2006 OCs TMDLs technical report includes a section (Section 9.0) on economic considerations. Other stakeholders in the watershed had also expressed concern regarding the costs of implementation of the OCs TMDLs. As a result, Regional Board staff requested additional input from the stakeholders on the economic consideration portion of the OCs TMDLs at the December 1, 2006 Public Workshop. However, only the Orange County Resources and Development Management Department (RDMD) actually provided additional economic cost information (see RDMD comment letter dated January 12, 2007; Attachment G). As discussed in Response #7, revisions to the proposed implementation plan include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay. An Independent Advisory Panel (IAP) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The work plan approach will allow Regional Board staff and stakeholders to prioritize and evaluate the proposed implementation tasks so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered, and to assure that implementation responsibilities are properly apportioned.

While, in contrast to the commenter's assertion, economic considerations have been taken into account in the proposed TMDLs, it is also worthwhile to note again (see Response # 7) that absent the approval of the proposed TMDLs, the Regional Board is required to implement the TMDLs promulgated by the USEPA. No economic considerations could come into play in the process of implementing the USEPA TMDLs, other than, perhaps,

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

some consideration of the appropriate compliance schedule to be specified in an enforcement order (see Response # 7).

**Comment #16**

Given the known errors present in the Draft TMDL, it would be arbitrary and capricious for the RWQCB to adopt it. The Draft TMDL appears to be based on poor science, and imposes unnecessary costs and burdens on the regulated community as a result of arbitrarily selected, unrealistic and scientifically unsupportable target levels. These facts, individually and collectively, demonstrate that the Draft TMDL is arbitrary and capricious, especially in light of the California Supreme Court's holding in *Topanga* that substantial evidence must support an administrative agency's findings and, further, that these findings must support the agency's decision. Pressing forward with the knowledge that the underlying science is demonstrably flawed, rather than taking the time necessary to underpin the rulemaking with sound science, is the very definition of capriciousness.

**Response #16**

The commenter's assertion that adoption of the TMDLs would be arbitrary and capricious is without merit since it is premised on the incorrect assumption that the science underlying the TMDLs is "demonstrably flawed". See Responses # 1 and 6.

**Comment #17**

California Water Code Section 13000 requires that activities and factors that may affect the quality of water be regulated to the highest water quality which is reasonable, considering all demands being made and to be made on the water and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. The Draft TMDL does not meet the Water Code's requirement of "reasonableness," which requires a substantive balancing of these factors. The RWQCB has made no meaningful effort to quantify the costs associated with its proposal even though they are obviously large. Once quantified or approximated, the RWQCB must articulate and justify such costs; to do so, the RWQCB must demonstrate that the Draft TMDL will result in a significant and beneficial reduction in harm.

**Response #17**

See Response #15. Regional Boards are required to adopt TMDLs as Basin Plan Amendments. There is no statutory *requirement* for a formal cost-benefit analysis (see Section 9.0 of the November 17, 2006 OCs TMDLs technical staff report). Economic considerations figured prominently in the development of the OCs TMDLs. (See Responses #7 and 15.)

**Comment #18**

The Draft TMDL does not comply especially with the requirement that TMDLs be "reasonably achievable" under Section 13241, and include a clear program of implementation under Section 13242. Under state law, water quality targets and allocations must take into consideration what water quality is reasonably achievable in light of social and economic factors. RWQCB failed to properly consider economics when adopting the targets. The RWQCB has failed to "identify the methods which are presently available for complying with the objective." RWQCB also failed to consider all "available information on

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

the costs associated with the treatment technologies or other methods” which may be available to comply with the proposed standards. In the face of evidence demonstrating that the economic consequences of adoption of RWQCB’s proposed TMDL are clearly significant, RWQCB’s failure to “articulate why adoption of the objective is necessary to ensure reasonable protection of beneficial uses” also is of concern.

**Response #18**

See Response #7. Numeric targets, such as those used in the proposed TMDLs, are not water quality objectives subject to the considerations of Water Code Section 13241. Neither the TMDLs themselves, nor the numeric targets are water quality objectives subject to the considerations of Water Code Section 13241. That said, however, and as described in prior responses (e.g., Response #7), the economic implications of the TMDLs, which were derived, in part, from the numeric targets, were considered in developing the TMDLs and implementation plan. The adoption of the TMDLs is necessary to achieve water quality standards, including beneficial uses, as required by the federal Clean Water Act and implementing regulations. Failure to approve the proposed TMDLs would necessitate action by the Regional Board to implement the USEPA TMDLs. (See again Response # 7). The sediment and fish tissue targets that drive the TMDLs proposed by Regional Board staff are the same as (i.e., no more stringent than) those used by the USEPA in promulgating organochlorine compounds TMDLs.

**Comment #19**

State law requires that TMDLs include implementation plans containing, but not be limited to, the following elements: (1) “[a] description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private”; (2) “[a] time schedule for the actions to be taken”; and (3) “[a] description of surveillance to be undertaken to determine compliance with objectives.” A TMDL and its implementation plan form the basis for RWQCB actions to manage impaired waterbodies. RWQCB’s adoption of the proposed targets would be invalid for the independent reason that the Board would have failed to adopt an appropriate program of implementation as required under Water Code Section 13242.

**Response #19**

The OCs TMDLs implementation plan (Attachment 2 to Resolution No. R8-2007-0024, Section 4.b.3) fulfills the requirements of Water Code Section 13242. As stated previously, the Regional Board staff’s proposed TMDLs/numeric targets have been judged to be scientifically defensible through the peer review process and by the State Water Resources Control Board and USEPA Region IX staff.

**Comment #20**

The California Environmental Quality Act (Pub. Resources Code, §§ 21000 et seq. (CEQA)) applies to RWQCB’s development of the Draft TMDL and proposed incorporation of it into the Basin Plan. Discussing the application of CEQA to TMDLs, the State Water Resources Control Board (“SWRCB”) has acknowledged that “numeric targets and load allocations would probably fall into the category of performance standards.” Thus, per SWRCB, “the Regional Water Board must identify the reasonably foreseeable methods of compliance with the wasteload and load allocations and consider economic factors for

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

those methods.” Treatment requirements like those implicit in the Draft TMDL also are subject to scrutiny as performance standards.

**Response #20**

Regional Board staff have prepared a Substitute Environmental Document (SED) (July 25, 2007)(Attachment B to the September 7, 2007 supplemental staff report) in compliance with CEQA. The SED identifies a reasonable range of reasonably foreseeable methods of compliance and evaluates reasonably foreseeable environmental effects, mitigation measures, and alternative means of compliance. The SED also takes into consideration a reasonable range of environmental and economic factors, population and geographic areas and specific sites, as required. However, the RWQCB is prohibited from specifying the manner in which compliance with its requirements implementing the TMDLs is to be achieved. Dischargers subject to the proposed TMDLs and wasteload/load allocations are responsible to identify compliance strategies, and to conduct requisite CEQA analysis of implementation of the selected strategies at the project level. The RWQCB cannot, as a practical matter, conduct project-level CEQA analyses, nor is it required to do so. (See Pub. Resources Code, Section 21159(d).)

**Comment #21**

CEQA requires the RWQCB to (1) include a description of the proposed activity, including a characterization of existing baseline conditions; (2) analyze alternatives to the proposed activity; and (3) include a discussion of any significant or potentially significant adverse effects on the environment as well as mitigation measures proposed to avoid or reduce such effects. BILD’s preliminary review suggests that the RWQCB’s Draft TMDL will result in substantial implementation and compliance costs, yet its suitability and effectiveness as the foundation for sediment regulation are questionable. Because the Draft TMDL does not adequately analyze the potential environmental effects of RWQCB’s proposal and implementation measures, RWQCB has not complied with CEQA’s mandates.

**Response #21**

See Response #20.

**Comment #22**

Under Section 21159 of the Public Resources Code, when RWQCB adopts a performance standard, it must prepare an analysis of the reasonably foreseeable environmental impacts arising from the reasonably foreseeable methods of compliance with the standard, as well as an analysis of economic and technical considerations arising from the reasonably foreseeable methods of compliance with the standard. Section 21159 imposes a special burden on regulatory agencies to consider implications of the standards they intend to impose. The need to consider the methods of compliance with the TMDL, and the associated economic and technical ramifications, constitutes an important additional step RWQCB must take to satisfy its CEQA obligations. RWQCB has provided no indication that it has conducted the necessary type of analysis of the foreseeable methods of compliance with the proposed TMDL.

**Response #22**

See Response #20.

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

**Comment #23**

The RWQCB is required to analyze the economic impacts associated with the Draft TMDL. This requirement derives from several sources, including provisions of the Porter-Cologne Act, the California APA, CEQA and guidance issued by the SWRCB. Our review indicates that numerous potential economic impacts may result from the proposed TMDL. Although the Draft TMDL has been in development for years, and has potentially enormous economic implications, the Report does not give any indication that any economic analysis has yet been performed. In fact, the Report states that Staff is not currently aware of costs associated with some of the implementation measures identified therein.

The requirement to perform economic analysis is not a perfunctory exercise. It is embedded in the first section of the Porter-Cologne Act, which states “activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, *economic* and social, tangible and intangible.” The legislative history of Porter-Cologne emphasizes that “[t]he regional boards must balance environmental characteristics, past, present, and future beneficial uses, and economic considerations (both the cost of providing treatment facilities and the economic value of development).” The SWRCB has acknowledged that the state agencies “cannot fulfill this duty [to consider economic impacts] simply by responding to economic information supplied by the regulated community.” The RWQCB has an affirmative duty to consider economics when adopting the Draft TMDL. BILD is concerned that the RWQCB has failed to comply with these crucial obligations.

**Response #23**

See Responses # 7, 15, 17 and 20.

**Comment #24**

Dr. James L. Byard and Dr. Ronald S. Tjeerdema are members of the RWQCB’s own Technical Advisory Committee (“TAC”), formed expressly to provide technical and scientific expertise to Staff. Incongruously, Staff appears to have ignored important comment offered by Dr. Byard and Dr. Tjeerdema during their service on the TAC. Not only is such disregard for the opinions of the TAC experts inexplicable and unjustified, it also appears to be squarely in violation of California law.

The California Health & Safety Code provides that where a Regional Board “disagrees with any aspect of the finding of the external scientific peer review entity,” no Regional Board “shall take any action to adopt the final version of a rule unless all of the following conditions are met: ... it shall explain, and include as part of the rulemaking record, its basis for arriving at such a determination in the adoption of the final rule, including the reasons why it has determined that the scientific portions of the proposed rule are based on sound scientific knowledge, methods, and practices.” To comply with these mandates, Staff must respond on record to Dr. Byard and Dr. Tjeerdema, either explaining, if it believes so, why the RWQCB’s selected experts are wrong and why the Draft TMDL is based on sound science, or more appropriately acknowledging the merits of these comments and adjusting



**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

the TMDL accordingly. BILD suspects, however, that Staff will remain unable to explain away these scientific conclusions.

**Response #24**

First, as a matter of clarification, the Technical Advisory Committee convened by Regional Board staff is not the same as the scientific peer review entity addressed in the California Health and Safety Code. Pursuant to the requirements of that Code, three independent scientific peer reviewers were identified by State Board staff in accordance with established practice. The scientific validity of the TMDLs has been confirmed by these independent expert peer reviewers, as well as by State Board staff and the USEPA (see Response #1). While there is arguably no legal requirement to respond to the comments of Dr. Byard and Dr. Tjeerdema, Board staff has done so in the course of TAC meetings and, more recently, in writing (see responses to Flow Science, Inc. reports in Attachment C1).

The Technical Advisory Committee (TAC) convened by Regional Board staff was composed of members with a broad spectrum of backgrounds and included staff from University of California - Riverside, University of Arizona, the US Fish and Wildlife Service (USFWS), the Southern California Coastal Water Research Project (SCCWRP), the San Francisco Estuary Institute (SFEI), the United States Environmental Protection Agency (USEPA), and the California Office of Environmental Health Hazard Assessment (OEHHA). Dr. Byard, an independent toxicologist, and Dr. Ronald Tjeerdema, University of California – Davis, were hired as consultants by The Irvine Company to respond to the Regional Board's efforts to adopt TMDLs for the organochlorine compounds. Both Dr. Byard and Dr. Tjeerdema were invited by Regional Board staff to participate in the TAC.

TAC meetings were held on May 4, July 13, and October 12, 2006 to provide review and discussion of sections of the draft technical staff report. Drs. Byard and Tjeerdema attended all three TAC meetings. Dr. Byard refused to participate fully in the TAC and did not fulfill the charge to provide review comments on other sections of the technical staff report as requested. At each meeting, Dr. Byard expressed his concerns to the other committee members regarding the targets, in particular his belief that the majority of staff's recommended targets were in error and were too low. In his October 10, 2006 letter to Dr. Kathy Rose, Regional Board staff, Dr. Byard stated the following:

*"At this point you are expecting comments on the more recently completed parts of the draft Staff Report, including the implementation plan. However, my comments will remain focused on the numeric targets. The reason is that the targets in the draft staff report are outdated, misrepresented or in error. To discuss other aspects of the draft Staff Report – including the implementation plan – when the targets are wrong, would be inappropriate."*

While Dr. Byard is certainly entitled to his own opinions, the TAC did not, as a whole, find fault with the targets proposed by Board staff. In fact, other members of the TAC also provided comments on the targets, indicating support for the technical approach but suggesting, based on independent risk assessments, that the targets might need to be more stringent than those proposed by Board staff to assure protection of sensitive Newport Bay species. Therefore, staff felt that the numeric targets as presented in the draft

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

staff report did not require further revision and that additional discussion was not necessary, especially since staff's numeric targets did not differ substantially from those promulgated by USEPA in their 2002 technical TMDLs for Toxic Constituents. Dr. Byard was also advised of the unacceptability of his recommendations for alternative targets since they had not been subject to requisite scientific peer review.

The County of Orange transmitted three Flow Science, Inc. reports, which included commentaries by Drs. Byard and Tjeerdema, to the RWQCB on November 23, 2006. Subsequently, Regional Board staff requested outside review of these reports and commentaries from Dr. Donald D. MacDonald, MacDonald Environmental Services, Ltd. (MESL), Dr. Harry Ohlendorf, CH<sub>2</sub>M Hill, Dr. Donald A. MacDonald, National Oceanic and Atmospheric Administration (NOAA), and Drs. Katherine Zeeman and Timothy Kubiak, USFWS (see Attachment E for copies of the electronic mail and letters received from these reviewers in response to Regional Board staff's request). Regional Board staff also responded directly to the Flow Science reports, relying in part on the expert opinions received from the outside reviewers (see Attachment C1). Regional Board staff's responses include citations and a list of the references cited can be found in Attachment C7.

Comment #25

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. In effect, a TMDL is the maximum assimilative capacity of a waterbody. Because the underlying targets in the Draft TMDL are so defective, the Draft TMDL is a gross miscalculation of San Diego Creek's, Upper Newport Bay's, and Lower Newport Bay's assimilative capacity.

Response #25

There is no defensible scientific basis to assert that the underlying targets in the proposed TMDLs are defective. Again, the scientific validity of the numeric targets and TMDLs has been affirmed by three independent expert peer reviewers. As stated previously (see Response #8), Board staff critically reviewed all available data and peer-reviewed guidelines in making target and TMDL recommendations. The OCs TMDLs are phased TMDLs and allow for revision and refinement of the TMDL components as necessary as new information becomes available.

Comment #26

The RWQCB has presented no empirical evidence of toxicity in the watershed at current levels. The Draft TMDL targets are based on old data and, in some cases, on studies of fish not resident in the watershed. A fundamental technical problem with the sediment target and the problem assessment is that they are not based on knowledge of the extent to which fish in the waterbodies at issue obtain organochlorines from a local food web connected to bottom sediments. The target and problem assessment assume that fish derive the vast majority of their organochlorine load from local sediment, but this assumption is not plausible, as some fish are non-resident and may obtain a substantial portion of their organochlorine body burden outside the Bay. To the extent that it is not feasible to determine the amount of organochlorines fish may be getting from local

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

sediment versus the amount they are getting from water and food or from outside the Bay, RWQCB is not justified in concluding that fish are getting all of their organochlorine load from the sediments in San Diego Creek, Upper Newport Bay and Lower Newport Bay.

**Response #26**

There is a substantial amount of uncertainty when evaluating concentrations in fish whose home range includes areas outside of the Bay. Pollutant concentrations in transient species captured within embayments could reflect the pollutant concentrations of either in-bay or offshore waters, depending upon the amount of time spent in each area. With some fish species, however, it is not known with certainty whether they are resident or transient. Disregarding certain data because residency cannot be established with certainty could lead to erroneous conclusions.

This difficulty was recognized by Board staff in conducting the impairment assessment. As stated in the November 17, 2006 OCs TMDLs technical report (p. 26), impairment was found whether or not the evaluation was restricted to resident fish species, or whether it considered both resident and transient species.

A study is currently being implemented by Dr. James Allen of SCCWRP to assess the food web transfer of OC pollutants and metals in fishes in Newport Bay (see Section 8.2, page 83, November 17, 2006 OCs TMDLs technical staff report). During implementation of these phased TMDLs, if approved, indirect effects due to bioaccumulation and biomagnification will be better evaluated, and the appropriate target species and protective tissue concentrations for those species will be identified. The numeric targets can then be revised, if necessary.

The origins of the assertions made by the commenter are not clear.

**Comment #27**

The Clean Water Act and EPA regulations require that a TMDL be “established at a level necessary to implement the applicable water quality standards . . . .” If the TMDL is improperly calculated, the technical conditions on which an implementation plan is based will be faulty. As a result, full implementation of the chosen numeric standards may or may not lead to attainment. Because RWQCB’s proposed TMDL is not scientifically supportable, for all of the reasons previously discussed, any implementation plan based on its deficient targets will be faulty and improper.

**Response #27**

The scientific validity of the recommended targets/TMDLs has been affirmed. See Responses #1, 8 and 25.

**Comment #28**

The Clean Water Act requires states to calculate TMDLs for all pollutants where “proper technical conditions” are present. EPA interprets pollutants to be suitable for calculation of a TMDL only where “proper technical conditions” are met, i.e., where there exist (1) analytical methods; (2) modeling techniques; and (3) data – necessary to develop a “technically defensible” TMDL. These proper technical conditions must be met with regard to each

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

element of the TMDL. The relationship (“translator”) between water quality standards and the TMDL must therefore be technically defensible. As EPA explained in its 2000 TMDL Guidance for California, “[n]umeric water quality target(s) must be identified, and an adequate basis for target(s) as interpretation of water quality standards must be specifically documented in the submittal.” A TMDL will only be “technically defensible” if the analytical methods, modeling techniques, and data are adequate to establish that a particular amount of loading is the maximum that the water body can receive while still complying with the standards.

RWQCB’s proposed numeric thresholds for sediments in the Draft TMDL suffer from several fundamental defects, including failure to reflect causal relationships between the specific pollutants and toxicity, failure to account for material contrary evidence, and reliance on statistical artifice, the Draft TMDL fails the Clean Water Act’s requirement of scientific defensibility. Thus, “proper technical conditions” are not met, and the organochlorines are not suitable for TMDL calculation under the Clean Water Act.

**Response #28**

See Responses #1, 8 and 25.

EPA Region 9’s TMDL Guidance (2000) states the following on page 2:

*“...the guidance focuses upon legal and procedural requirements and does not provide technical guidance concerning scientific methodologies for developing TMDLs.”*

The OCs TMDLs proposed numeric sediment targets are the same targets selected by USEPA in their “Total Maximum Daily Loads for Toxic Pollutants, San Diego Creek and Newport Bay, California” (USEPA, 2002), which were promulgated in accordance with their own 2000 TMDL guidance. In developing the OCs TMDLs, Board staff also followed the recommendations in EPA Region 9’s 2000 TMDL Guidance as well as California’s 2005 Process for Addressing Impaired Waters in California and the 2004 Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List, and used best professional judgment (BPJ). The OCs TMDLs have been found to be scientifically defensible by the peer reviewers, SWRCB staff and EPA Region 9 staff.

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***Carollyn Lobell, Nossaman, Guthner, Knox & Elliott, LLP for  
CICWQ/California Farm Bureau Federation***

**Comment #29**

As described in previous stakeholder submittals to the Regional Board and verbal testimony at the December 1, 2006 public workshop on the OCs TMDLs, there is serious concern that the water quality targets as currently proposed by Regional Board staff contain many errors. As a result of these errors, the proposed targets and Basin Plan Amendment are not legally and technically defensible as required by the Clean Water Act. Thus, it is difficult to thoroughly comment on the Regional Board’s Technical Staff Report entitled “Total Maximum Daily Loads for Organochlorine Compounds” (November 16, 2006) (“Staff

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Report”) until the errors with respect to water quality targets are eliminated and technically defensible water quality targets are established. Our primary legal and policy comments are driven by the determination of the water quality targets, so these comments on the Amendment are preliminary, and it may be necessary to submit further written comments as the TMDL process proceeds and additional information becomes available. As we have reiterated throughout this process, the stakeholders are committed to resolving all scientific issues related to OCs in the watershed, and remain committed to preserving beneficial uses from water quality impairment.

Response #29

See Responses #1, 8 and 25.

Comment #30

In addition to the comments contained herein, CICWQ and the Farm Bureau concur with the comments being submitted by the County of Orange on this date and hereby incorporate by reference previous comments and technical submittals on the OCs TMDL, specifically the November 21, 2006 letter and technical reports submitted by the County of Orange, including the Flow Science Report entitled “*DDT Analysis for the Newport Bay Watershed*” (November 2006), the Flow Science Report entitled “*Supplemental Report on Organochlorine Compounds: Toxaphene in the Newport Bay Watershed*” (November 2006), and the Flow Science Report entitled “*Supplemental Report on Organochlorine Compounds: Chlordane in the Newport Bay Watershed*” (October 2006), and hereby respectfully request that all of these documents be added to the administrative record for the subject TMDL and Amendment.

Response #30

Please see Attachment C1 for responses to the three Flow Science reports referenced and see Attachment C5 for responses to the County of Orange’s January 12, 2007 comment letter. All comments received and supporting documents are included in the administrative record for the proposed TMDLs.

Comment #31

As has been noted in previous technical comments and reports, there are numerous errors in the Staff Report’s data and analysis which call into serious question the basis for the proposed Amendment. The Staff Report establishes TMDL targets for sediment and fish tissue concentrations of OCs, which are derived from the literature. These literature values are not based upon California Toxics Rule (CTR) criteria or other formally adopted water quality standards, but rather were selected by Regional Board staff to implement narrative water quality objectives contained in the Basin Plan. The Regional Board’s Technical Advisory Committee (TAC) for the OCs TMDL reviewed the selected literature values for the TMDL targets and found them to be based upon flawed analysis, outdated data, and incorrectly interpreted data.

Response #31

The scientific validity of the numeric targets/TMDLs proposed by Regional Board staff has been confirmed by three independent expert peer reviewers, as well as staff of the State Board and the USEPA. The Technical Advisory Committee (TAC) convened by Regional

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Board staff, and separate from the peer reviewers/process required by the California Health and Safety Code, did not, as alleged above, find that staff's proposed numeric targets were "based upon flawed analysis, outdated data, and incorrectly interpreted data". The allegations of flawed science are primarily based on the opinion of one TAC member, Dr. James Byard. Dr. Byard, an independent toxicologist, was hired as a consultant by The Irvine Company to respond to the Regional Board's efforts to adopt TMDLs for the organochlorine compounds. Dr. Byard was invited by Regional Board staff to participate in the TAC. However, Dr. Byard refused to participate fully in the TAC and did not fulfill the charge to provide review comments on other sections of the technical staff report as requested (see Response #24).

Dr. Byard expressed his concerns regarding staff's proposed numeric targets, in particular his belief that the targets were in error and were too low, to the other TAC members at each and every TAC meeting. Board staff advised Dr. Byard that his recommendations could not be considered since they had not been subject to defensible scientific peer review. More importantly, the TAC did not, as a whole, find fault with the targets proposed by Board staff. In fact, other members of the TAC also provided comments on the targets, indicating general support for Board staff's technical approach. In sharp contrast to Dr. Byard's comments, some TAC members suggested that staff's numeric targets might actually need to be more stringent than currently proposed to assure protection of sensitive Newport Bay species. Therefore, revision of the proposed numeric targets in accordance with Dr. Byard's recommendations was neither appropriate nor necessary. . Moreover, Board staff's recommended sediment and fish tissue targets, which drive the calculation of the proposed TMDLs, are the same as those employed by the USEPA in their promulgated organochlorine compounds TMDLs. Clearly, the USEPA found the numeric targets scientifically defensible and has commented to that effect (January 11, 2007 letter to Board Chair Beswick (Attachment G).

The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets and loads as new information becomes available. Assuming that the stakeholders avail themselves of the opportunity afforded in the proposed implementation plan (Task 7) to develop and implement a comprehensive Work Plan approach, an Independent Advisory Panel (IAP) would be established during implementation of these TMDLs; one of the first tasks of the IAP would likely be to re-evaluate the TMDL numeric targets.

**Comment#32**

Because of these errors in data and analysis underlying the TMDL targets and the Amendment, including the use of inappropriate, unsupportable literature values, adoption of the proposed Amendment based on the Staff Report would be arbitrary and capricious. Under the federal Administrative Procedure Act, agency actions, findings, and conclusions found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law are to be set aside. 5 U.S.C. section 706(2)(A). As discussed below, the TMDL will require approval by the Environmental Protection Agency to be effective and thus this federal standard of review is applicable. The Supreme Court has observed that an agency decision is "arbitrary and capricious if the agency has . . . entirely failed to consider an important aspect of the problem." *Arkansas v. Oklahoma*, (1992) 503 U.S. 91, 113. As detailed below, the Staff Report failed to take a number of important aspects of the

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

complicated issues associated with OCs into account when deriving the water quality targets and in the impairment analysis. In a case involving the issuance of a TMDL for dioxin for the Columbia River, the court noted the standard that would be applied to determine if the government agency's action with respect to approval of that TMDL was arbitrary and capricious: "an agency must articulate a satisfactory explanation for its action. There must be a rational connection between the facts found and the choices made. The agency's explanation must be sufficient to permit effective judicial review, and the reviewing court should not attempt to make up for deficiencies in the agency's decision. A court 'may not supply a reasoned basis for the agency's action that the agency itself has not given.'" *Dioxin/Organochlorine Ctr. v. Clarke* (1995) 57 F.3d 1517, 1525, internal citations omitted. As will be discussed in further detail in our comments below, we do not believe that the Staff Report has satisfied this standard.

A similar standard applies under state law. In *United States v. State Water Resources Control Board*, (1986) 182 Cal. App. 3d 82, a case involving the California SWRCB's adoption of a plan establishing new water quality standards for salinity control and for protection of fish and wildlife, the court explained the standard of review applied to quasi-legislative actions under the principals of California administrative law: "In performing its regulatory function of ensuring water quality by establishing water quality objectives, the Board acts in a legislative capacity. A court will uphold the agency action unless the action is arbitrary, capricious, or lacking in evidentiary support. A court must ensure that an agency has adequately considered all relevant factors, and has demonstrated a rational connection between those factors, the choice made, and the purposes of the enabling statute." Here, the Regional Board has failed to consider a number of factors in deriving the water quality targets, and in development of the TMDL. Further, the Staff Report does not provide sufficient scientific evidentiary support to justify the Amendment.

Response #32

See Responses #1, 6, 8 and 16.

Comment #33

The Regional Board maintains the flexibility to review all of the relevant studies and evidence in developing TMDLs. With respect to the OCs TMDL, this includes the studies and evidence behind the Environmental Protection Agency ("EPA") technical TMDLs and the technical TMDLs themselves. In conducting its review of such studies and evidence, the Regional Board can, and should, with respect to the OCs TMDL, conduct a de novo review and make new determinations, independent of the EPA, with respect to impairment and the appropriate water quality targets to address any impairments that are found to exist.

First, the TMDL targets adopted by the EPA in 2002, including maximum loads, do not have to be adopted by the Regional Board if the Regional Board determines that different maximum loads and/or TMDL targets are scientifically more appropriate. Environmental Protection Agency, Region 9, *Total Maximum Daily Loads for Toxic Pollutants – San Diego Creek and Newport Bay, California* (June 2002), p. 71. EPA stated in its 2002 Toxics TMDL Report for Newport Bay "the State may adopt the TMDLs identified in the [2002 Toxics TMDL] or further assess these pollutants and adopt different TMDLs if warranted."

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

*Id.* Thus, it is well within the Regional Board's discretion to adopt scientifically defensible maximum loads and TMDL targets that are different than those set by EPA in 2002.

Second, EPA directed the State to consider additional scientific studies and evidence to determine if maximum loads and targets are scientifically defensible and appropriate. "It is also appropriate to collect and analyze additional monitoring data to improve the understanding of pollutant sources and effects, periodically review the TMDLs and implementation actions in light of new monitoring results, and revise the TMDLs and implementation actions if necessary." Environmental Protection Agency, Region 9, *Total Maximum Daily Loads for Toxic Pollutants – San Diego Creek and Newport Bay, California* (June 2002), p. 71. Thus, not only does the Regional Board maintain the flexibility with respect to the OCs TMDL to set maximum loads and/or targets that are different than those set by EPA, but EPA actually directs the State to do so when the available scientific evidence and studies shows that such action is appropriate.

Third, if the Regional Board subsequently adopts TMDLs which are different from the TMDLs established by EPA, the Regional Board will submit them for EPA approval. EPA will review the TMDLs submitted by the Regional Board to determine if they meet all TMDL requirements, as explained in Environmental Protection Agency, Region 9, *Total Maximum Daily Loads for Toxic Pollutants – San Diego Creek and Newport Bay, California* (June 2002), pp. 2; 6. And if the TMDL is approved by EPA, it will supersede the TMDLs established by EPA in 2002. Environmental Protection Agency, Region 9, *Total Maximum Daily Loads for Toxic Pollutants – San Diego Creek and Newport Bay, California* (June 2002), p. 3; 40 C.F.R. 130.79(d)(2). Thus, EPA will review the OCs TMDL and its targets as approved by the Regional Board to determine compliance with TMDL requirements, and if approved, the TMDL will replace the previously established EPA Toxics TMDL and associated water quality targets.

**Response #33**

Board staff did in fact critically review EPA's 2002 promulgated toxic TMDLs for the San Diego Creek/ Newport Bay watershed (see second paragraph on page 1 of the November 17, 2006 OCs TMDLs technical report). Staff also included additional data and studies in their impairment assessment that were completed after EPA's promulgation of their technical TMDLs. A list of the studies and data reviewed for Board staff's impairment assessment can be found in Section 2.1 of the technical staff report. Staff corrected minor errors found in EPA's TMDLs; updated the TMDL calculations using more recent data; revised the impairment assessment in accordance with the recently adopted Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (2004 State Listing Policy); and incorporated the allowable annual sediment loads for San Diego Creek and its tributaries and Newport Bay, pursuant to the established Sediment TMDLs for these waters, into the loading capacity calculations to ensure consistency between the OCs and sediment TMDLs for the watershed.

**Comment #34**

Under the Clean Water Act, states are required to calculate TMDLs for pollutants only where "proper technical conditions are present," i.e., where there exist (1) analytical methods; (2) modeling techniques; and (3) data necessary to develop a "technically



**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

defensible” TMDL. These proper technical conditions must be met with regard to each element of the TMDL. See *EPA Guidance: Total Maximum Daily Loads Under The Clean Water Act*, 43 Fed. Reg. 60,662 (Dec. 28, 1978); see also 43 Fed. Reg. 42, 303 (September 20, 1978) (proposal); 43 Fed. Reg. at 60, 665. Thus, any TMDL developed by the Regional Board must comply with the above requirements, meaning that it must be technically defensible.

Further, as explained in the *Guidance for Developing TMDLs in California* (“Region 9 Guidance”), “[n]umeric water quality target(s) must be identified, and an adequate basis for target(s) must be specifically documented in the [TMDL] submittal.” *Environmental Protection Agency Region 9 Guidance for Developing TMDLs in California* (January 2000). The Region 9 Guidance also requires that TMDLs be “legally and technically defensible” and that all elements of the TMDL provide an appropriate level of complete and accurate technical analysis. *Id.* This is particularly important where narrative (e.g., beneficial use or antidegradation) water quality objectives or standards are implemented in TMDLs, such as the instant case. Such a TMDL will only be “technically defensible” where the analytical methods, modeling techniques and data are adequate to establish that a particular amount of loading is the maximum that the water body can receive while still complying with the applicable water quality standards. Adopting a TMDL that is technically indefensible and lacks the requisite scientific basis is in violation of the Clean Water Act, the applicable regulatory guidance and is arbitrary and capricious.

**Response #34**

See Responses #1, 6, 8, 25 and 28.

**Comment #35**

As described in the Staff Report, the Regional Board formed a Technical Advisory Committee (“TAC”) to review draft sections of the TMDLs and make comments and suggestions. Although the Staff Report states that comments and suggestions from the TAC meeting participants “were used to make modifications and improvements to the TMDL,” it appears that the comments of the TAC regarding their peer review of staff-selected literature values were ignored. In fact, Dr. James Byard testified before the Regional Board on December 1, 2006 that he had “never received a written or verbal response to the technical issues, including those described above, although he raised these issues as a TAC member, repeatedly.” As a result, we are concerned that the expertise of the TAC has not been adequately utilized so as to reach targets that are technically defensible. CICWQ and the Farm Bureau concur and support the comments provided by the County of Orange on this issue, and support the suggestion that the TAC should be reconvened, with facilitation, to address the errors and technical issues.

**Response #35**

Board staff did incorporate the majority of the TAC members’ comments. Dr Byard’s assertions regarding staff’s proposed numeric targets however, were not supported by the majority of the TAC members (see Responses # 17 and 24). Dr. Byard’s concerns were orally addressed at the TAC meetings, but Dr. Byard refused to acknowledge the fact that many of the TAC members did not agree with his assessment of the targets. In fact, several of the TAC members suggested, based on their own analysis of the data, that

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

staff's numeric targets might not be stringent enough to protect certain sensitive species in Newport Bay. Dr. Byard has consistently represented his opinions as fact, even though his commentaries have not been subject to peer review, do not include calculations or documentation to support his assertions, and contain several inaccuracies, misstatements or errors. Since Dr. Byard's commentaries have not gone through the peer review process as required by the 2004 State Listing Policy, his proposed alternative numeric targets cannot be used in the OCs TMDLs. The OCs TMDLs have been judged to be scientifically defensible by three independent expert peer reviewers, SWRCB staff and USEPA Region 9 staff.

Rather than reconvene the TAC, Board staff, after consultation with staff from the County of Orange, have revised the Basin Plan Amendment (BPA) to include a task (Task 7; see Attachment 2 to Resolution No. R8-2007-0024, 4.b.3) that would provide the opportunity to establish an Independent Advisory Panel (IAP) composed of a group of objective, qualified, scientific experts similar to that convened by the Nitrogen and Selenium Management Program. The OCs TMDLs are phased TMDLs and allow for revision and refinement of the targets; one of the first tasks of the IAP, if formed, will likely be to re-evaluate the TMDL numeric targets.

**Comment #36**

A TMDL is equivalent to the maximum amount of the relevant pollutant that the water can receive without violating water quality standards – expressed as the sum of loading attributed to point, nonpoint, and background sources. In order for “proper technical conditions” to be met with regard to determining how much loading a water body can receive from specific sources without violating the applicable water quality standards, it is necessary to understand the water body's capacity to assimilate loading. A number of factors should be evaluated to understand that component of the TMDL analysis.

Where an assimilative capacity study has not been done, or where that study is not supported by “technically defensible” analytical methods, modeling, or data, the proper technical conditions for calculation of TMDL allocations and waste load allocations are not present. With this TMDL, there are both questions about the TMDL targets, as discussed above, and concern with the allocations presented in the TMDL. In this case, allocations were apportioned between different sources based only on land use area within the watershed. For example, construction activities received 28% of the total loading capacity, as construction activities were assumed by the Regional Board to occur over 28% of the total land area within the watershed. This calculation method ignores the assimilative capacity of the watershed. In reality, runoff concentrations from a single land use type could be higher than the allocation calculated using land area alone if concentrations from other land use types were in turn lower (i.e., so that the concentration in the receiving water, which receives runoff from all land use types would be below the applicable receiving water limit).

**Response #36**

See Responses #8 and 25. The allocation calculations do not ignore the assimilative capacity. The assimilative capacity is equivalent to the loading capacity; the necessary load reductions were calculated by subtracting the calculated loading capacities from the

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

estimated existing loads. The allocations were then determined by normalizing the land use area to the estimated relative pollutant source contribution for each land use category (see Section 6.0 and Table 6-3 in the November 17, 2006 OCs TMDLs technical report). The allocations were calculated using the best available data and Board staff's best professional judgment (BPJ). The phased implementation approach will allow refinement of the allocations and other aspects of the TMDLs, if warranted.

**Comment #37**

Data have been provided to the Regional Board establishing that concentrations of OCs have declined significantly since their use was banned, and that OC concentrations will continue to decline in the future. These trends over time have been quantified with a high degree of statistical significance, yet the Staff Report does not regress historical data to current concentrations and does not explicitly consider how these trends in time will affect concentrations of OCs in the future. These trends in time must also be considered in establishing loading capacities and load and wasteload allocations.

**Response #37**

Trends alone may not be used to delist or negate the need for TMDLs and data cannot be regressed out but must be based on actual samples (2004 State Listing Policy). The Qualitative Environmental Analysis, Inc. (QEA) memo dated October 3, 2006, which was provided to Flow Science, Inc. and included as Appendix A of their report on DDT (Flow Science, Inc., November 20, 2006), states that "the rate of decline of DDT in the Newport Bay system has slowed over time" with the rate of decline in DDT concentrations in sediment, fish tissue and mussels being greater during the earlier time period reviewed (early 1980s - 1990s). The State Listing Policy also recommends that a trend analysis consider the influence of seasonal effects, inter-annual effects, changes in monitoring methods, changes in analysis of samples, and any other factors deemed appropriate. It is not clear that these have been adequately or appropriately considered in the QEA/Flow Science analysis of contaminant trends in the watershed.

Regional Board staff evaluated OC contaminant trends in sediment, shellfish and fish tissue and recognized that they are significant and declining (Section 2.0 and Figures 2-1 through 2-5, November 17, 2006 OCs TMDLs technical report). Accordingly, Board staff recommended phased TMDLs to allow for refinement and revision of the TMDLs over time. The proposed TMDL implementation plan is focused to a large degree on actions intended to accelerate and augment the natural attenuation process. The proposed implementation plan includes monitoring to evaluate the attenuation process and the efficacy of control actions in the watershed. While natural attenuation has occurred, concentrations of OC pesticides and PCBs in sediment, shellfish and fish tissue data indicate that these pollutants are continuing to bioaccumulate in the biota in the watershed.

**Comment #38**

The Clean Water Act requires that "[The total maximum daily load], shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." 33 U.S.C. § 1313(d)(1)(C). For a TMDL to be technically defensible, the methods, modeling, and data

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

must be adequate to determine how seasonal variations in loading, flow and mixing rates, and other water quality characteristics (e.g., chemistry, temperature, source attenuation) affect the loading capacity over the course of the year.

Response #38

Comment noted. The OCs TMDLs meet the Clean Water Act requirements referenced (see Sections 4 through 7 of the November 17, 2006 OCs TMDLs technical report). The OCs TMDLs have been judged to be scientifically defensible through the peer review process and by SWRCB and USEPA staff. The U. S. EPA has also stated that the proposed TMDLs meet all regulatory requirements (see January 11, 2007 letter to Chair Carole Beswick, Attachment G).

Comment #39

The EPA Region 9 Guidance requires that a number of technical factors be considered in TMDL development, including mixing (p. 4; 12), flow (p. 7), source attenuation (p. 4) and assimilative capacity (p. 4). It is not clear from the Staff Report that the Regional Board has adequately considered these important factors when developing the proposed waste load and load allocations. As explained above, and as noted in the Region 9 Guidance, these factors are critical both to understanding the loading capacity of a certain water body and to calculating appropriate and defensible load allocations. Pursuant to federal law, these are factors that must be considered by the Regional Board to derive appropriate, scientifically defensible water quality targets.

Response#39

See Responses #25, 36 and 38. The USEPA has stated that the proposed TMDLs meet all regulatory requirements.

USEPA Region 9's TMDL Guidance (2000) states the following on page 2:

*"...the guidance focuses upon legal and procedural requirements and does not provide technical guidance concerning scientific methodologies for developing TMDLs."*

In developing the OCs TMDLs, Board staff followed the recommendations in EPA Region 9's 2000 TMDL Guidance, California's 2005 Process for Addressing Impaired Waters in California, the 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, and USEPA's 2002 Total Maximum Daily Loads for Toxic Pollutants for the San Diego Creek and Newport Bay watershed, and used best professional judgment (BPJ). The OCs TMDLs have been found to be scientifically defensible by the expert peer reviewers, SWRCB staff and EPA Region 9 staff.

Comment #40

In response to comments made at the December 1, 2006 workshop presentation regarding the need to adopt the lowest possible water quality targets, even if they are based on errors, to avoid indirect toxicity to wildlife, we attach a summary of technical information previously submitted to the Regional Board regarding bioaccumulation of organochlorines in the Newport Bay watershed and the vicinity. See attached letter report prepared by Dr. Byard summarizing scientific information submitted in the Flow Science reports regarding

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

potential for OCs bioaccumulation in the watershed. This report summarizes the reasons that indirect toxicity to wildlife and humans due to bioaccumulation of OCs will not occur in this watershed, even if the Regional Board adopts the corrected water quality targets that do not rely on erroneous literature values (see the Draft Matrix of Differences in Proposed Targets for the Draft OC TMDL, Attachment A to the County of Orange comments submitted January 12, 2006). CICWQ and the Farm Bureau agree that bioaccumulation must be taken into account in establishing OCs TMDL targets. But the available scientific information simply does not indicate that the Regional Board's proposed targets are necessary to avoid harm to wildlife due to indirect toxicity or bioaccumulation. A proper analysis of the potential for bioaccumulation to result in adverse effects to wildlife must be considered before the Regional Board adopts the TMDL and its water quality targets as an Amendment to the Basin Plan. Absent such an analysis the TMDL is not technologically defensible and its adoption would be arbitrary and capricious contrary to federal law.

**Response #40**

The statement that at the December 1, 2006 Public Workshop Board staff commented that there was a "need to adopt the lowest possible water quality targets, even if they are based on errors, to avoid indirect toxicity to wildlife" is incorrect. The commenter should review the transcript of the December 1, 2006 proceeding. Board staff do not agree with the assertions made by Dr. Byard, Flow Science, Inc. and other stakeholders that staff's proposed water quality targets are "based on errors" and are not supported by the available scientific information (see Attachment C1, Response to Flow Science, Inc. Reports for Board staffs' detailed responses to these allegations). Regional Board staff selected numeric targets below which no observable adverse effects or low observable effects are expected to occur. Dr. Byard's proposed numeric targets, however, are at levels at which adverse effects in wildlife have been observed. Such targets are not sufficient to protect beneficial uses and meet the mandate of the TMDLs, which is to achieve water quality standards. These differences in the selected level of protection results in large differences in the numeric targets. While Regional Board staff's numeric targets are lower than those proposed by Dr. Byard, the US Fish and Wildlife Service indicated that they were concerned that staff's proposed numeric targets were not low enough or sufficiently stringent to protect sensitive species in Newport Bay (see USFWS February 28, 2007 comment letter, Attachment G).

**Comment #41**

The Regional Board has a duty to ensure that the TMDL and its Implementation Plan will protect and restore the applicable beneficial uses, to the extent such protection and restoration is shown to be necessary, and is not simply aimed at meeting certain numeric targets. The Clean Water Act does not call for a detection based approach to water quality and thus, the TMDL and the water quality targets are more properly derived as effects-based targets that are tied to protection of the applicable beneficial uses of Newport Bay and San Diego Creek.

Neither the Clean Water Act or Porter-Cologne Water Quality Control Act ("Porter-Cologne") mandate that a detection based approach be applied to TMDL development and implementation. Further, a detection based approach does not comport with the purpose and policies of the Clean Water Act and Porter Cologne. The Clean Water Act "obligates

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

the states to establish the TMDL's in accordance with a priority ranking based upon both the severity of the pollution and the water's designated uses. *Environmental Defense Fund, Inc. v. Costle* (1981) 211 U.S. App. D.C. 313. Thus, TMDL's are to be developed to protect beneficial uses – not to ensure that every body of water or every individual discharge meets certain numeric standards regardless of use impairment. Porter-Cologne also does not call for absolute water purity but rather for the “highest use of water which is reasonable.” Cal. Water Code § 13000. Further, Porter-Cologne generally provides for regulatory oversight over discharges that have the potential to impact beneficial uses and the environment, not simply discharges that contain a certain amount of a pollutant. See, e.g., Cal. Water Code § 13260 (requiring Report of Waste Discharge for discharges that might impact the quality of waters of the state.) Thus, the focus of both of these water quality statutes is on the protection of beneficial uses – not on meeting an arbitrary water quality target or standard.

**Response #41**

The commenter does not make clear in what way the proposed TMDLs, or the numeric targets employed in developing them, reflect a “detection-based approach” or attempt to meet an “arbitrary water quality target or standard”; indeed, the meaning of “detection-based approach” is not clear. Perhaps these comments proceed from the commenter's incorrect assumption that Board staff had asserted that the lowest possible numeric targets needed to be adopted (see Comment and Response #41).

The commenter is correct that the purpose of TMDLs is to assure that water quality standards, which include beneficial uses, are achieved. Numeric targets identify specific endpoints in sediment, water column, or tissue that, if achieved, are expected to result in attainment of water quality standards. They are not in-and-of-themselves, water quality standards. Numeric targets are a requisite part of the TMDLs and are the basis for calculating the TMDLs, wasteload allocations and load allocations. Board staff identified numeric targets that, in staff's judgment, would meet the fundamental purpose of the TMDLs. Notably, the same targets were employed by the USEPA in the organochlorine compounds promulgated by the agency in 2002. Board staff recommended that sediment targets be prioritized over water column and fish tissue targets in the OCs TMDLs because (1) the OCs pollutants are directly associated with fine sediment; (2) the OCs pollutants are primarily transported within the watershed via sediment transport; (3) currently available water column data are limited; (4) impacts to biota occur through bioaccumulation and biomagnification of the OC pollutants and these impacts can ultimately be related to concentrations in sediment; and (5) attainment of sediment targets should result in attainment of water column criteria and tissue screening values, and should thus, offer protection of aquatic life, wildlife, and human health (see Section 3.4 in the November 17, 2006 technical report). The OC pesticides are ranked as a high priority for TMDL development (2002 California 303(d) List).

**Comment #42**

It is clear from the available scientific evidence, including the Regional Board and EPA's prior problem statements that many of the OC compounds are decreasing in the environment and are not causing chronic or acute toxicity in the watershed. For example, EPA's 2002 Toxics TMDL Report provides, “There is substantial evidence indicating that

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

levels of these compounds in the Bay sediments and aquatic organisms has declined over the past 20 years or more. If future monitoring indicates that declines in levels of pollutants in the watershed are continuing or accelerating, it may be unnecessary to implement additional controls.” Environmental Protection Agency, Region 9, *Total Maximum Daily Loads for Toxic Pollutants – San Diego Creek and Newport Bay, California* (June 2002), p. 75. It also is important to note that the Regional Board’s 2000 problem statement determined that a Toxicity Identification Evaluation (“TIE”) should be conducted to determine the actual cause of toxicity, then implementation measures should be geared toward controlling the actual cause of toxicity in Newport Bay, yet the TMDL, as currently proposed, does not provide for conducting such a study. *Final Problem Statement for the Total Maximum Daily Load for Toxic Substances in Newport Bay and San Diego Creek* (December 2000), p. 86. Thus, available information from EPA indicates that OCs are not the pollutants impairing use in this watershed.

The technical reports previously submitted to the Regional Board support the conclusion that OCs are continuing to decline in the watershed as a result of natural attenuation and that those compounds are not the likely cause of toxicity in Newport Bay and San Diego Creek. Flow Science *DDT Analysis for the Newport Bay Watershed* (November 2006); Flow Science *Supplemental Report on Organochlorine Compounds: Toxaphene in the Newport Bay Watershed* (November 2006); and Flow Science *Supplemental Report on Organochlorine Compounds: Chlordane in the Newport Bay Watershed* (October 2006). Eliminating chemicals from the environment that are naturally attenuating, when it is statistically almost certain that the compounds are not causing chronic or acute toxicity is inconsistent with the purpose of TMDLs which is protection of beneficial use, and an arbitrary and capricious use of regulatory authority. More importantly, requiring substantial expenditures of public funds to achieve water quality that comports with arbitrary targets without improving beneficial use is poor policy.

**Response #42**

See Responses # 8, 11, 15 and 37. The USEPA found impairment of San Diego Creek, Upper Newport Bay and Lower Newport Bay due to certain organochlorine compounds and promulgated TMDLs for those pollutant/waterbody combinations in 2002. Clearly, this contradicts the commenter’s assertion that “available information from EPA indicates that OCs are not the pollutants impairing use in this watershed”.

Toxicity Identification Evaluations were performed by SCCWRP as part of a State-funded study (Bay et al., 2004); however, the results of the TIEs were inconclusive. The OCs TMDLs implementation plan (Section 8.0 in the November 17, 2006 technical staff report; Attachment 2 to Resolution No. R8-2007-0024, Sec. 4.b.3.) includes a task to evaluate sediment toxicity in San Diego creek and its tributaries, and in Upper and Lower Newport Bay (see Task 9 (1) in Sec. 4.b.3., Attachment 2 to Resolution No. R8-2007-0024). Again, Board staff do not agree with the assessment that the organochlorine compounds are not causing toxicity (see responses to Flow Science, Inc. reports, Attachment C1).

**Comment #43**

Under CWA § 303(d)(1)(C) and EPA regulations, a TMDL must be “established at a level necessary to implement the applicable water quality standards . . . .” 33 U.S.C. §

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1). The Region 9 Guidance emphasizes that “[t]he TMDL and associated waste load and load allocations must be set at levels necessary to result in attainment of all applicable water quality standards . . . .” *Region 9 Guidance*, p. 2. In other words, the TMDL and the Load Allocations (“LAs”) and Waste Load Allocations (“WLAs”) must be calculated such that implementation of the TMDL will result in attainment of applicable water quality standards. Further, the *Region 9 Guidance* states that “EPA’s national policy is that all TMDLs are expected to provide reasonable assurances that they can and will be implemented in a manner that results in attainment of water quality standards.” *Region 9 Guidance*, p. 12.

For the OCs, relevant water quality objectives are provided by the California Toxics Rule (CTR). The proposed TMDL targets for sediment and fish tissue are based on narrative Basin Plan objectives, and may not be consistent with CTR water quality objectives, especially since, as discussed above, they are based on literature values plagued by many errors. The OCs TMDL provides no reasonable assurance that it can be implemented in a manner that results in attainment of TMDL targets because compliance with those proposed targets, several of which are below pollutant detection limits, cannot be confirmed by available technologies or methodologies. Thus, the degree to which the TMDL is implemented, or even can be complied with, cannot be discerned, nor can there be any reasonable assurance that implementation of the TMDL will achieve TMDL targets contrary to federal law.

**Response #43**

See prior responses regarding the numeric targets employed in the proposed TMDLs and their scientific defensibility and propriety, e.g. Responses #1, 6, 8 and 25. The scientific and legal validity of the targets/TMDLs has been confirmed by the USEPA (see letter to Board Chair Beswick dated January 11, 2007; Attachment G).

The CTR criteria are water column based criteria. OC pollutants are highly hydrophobic and have low water solubility; therefore, Board staff employed sediment- or tissue- based numeric targets for developing and implementing OCs TMDLs to assure that beneficial uses and established narrative toxic substance objectives are met. USEPA also elected to prioritize sediment numeric targets over the CTR water quality criteria in their technical TMDLs for organochlorine compounds (USEPA 2002). The numeric targets employed by USEPA to interpret the narrative Basin Plan objectives for toxic substances are generally the same as those proposed in Board staff’s recommended TMDLs. The Los Angeles RWQCB used the same sediment numeric targets for their Calleguas Creek OCs TMDLs, but back-calculated fish tissue targets from the CTR criteria for protection of wildlife and human health (LWA 2005) using bioconcentration factors (BCFs) from the literature to develop Threshold Tissue Residue Levels (TTRLs). LARWQCB’s calculated TTRLs are lower than those proposed by Board staff for the Newport Bay OCs TMDLs. For example, the calculated TTRL for protection of human health is 32 µg/kg wet weight compared to the OEHHA screening value of 100 µg/kg wet weight used in the Newport Bay OCs TMDLs. The TTRL approach was not used by SARWQCB staff because BCFs only reflect pollutant uptake by an organism via water; most foodweb pathways include multiple sources of exposure through diet in addition to water uptake.



***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

The currently proposed TMDL sediment and fish tissue numeric targets are not below pollutant detection limits (e.g., see discussion regarding toxaphene detection under Attachment C5, Response to Local Agency/Municipalities Comments, Response #14). However, the detection limits of many of the analytical methods currently used to determine OC pollutant concentrations in water are often higher than the OCs CTR criteria concentrations. Therefore, it will be necessary to use laboratory analytical methods with detection limits that are lower than the CTR OC pollutant water quality criteria so that compliance with the CTR can be determined.

Regional Board staff is aware of the stakeholders' concerns regarding implementation of the TMDLs in the watershed. Implementation of the OCs TMDLs relies to a large extent on iterative improvements to BMPs, monitoring, and other programs that are already being implemented pursuant to existing permits (e.g., the MS4 permit) and /or in response to established TMDLs for the watershed (e.g., the sediment TMDLs). If the stakeholders choose to pursue the development of a comprehensive work plan (Task 7 in the recommended TMDL implementation plan), Regional Board staff and stakeholders will have the flexibility to prioritize and evaluate the proposed implementation tasks so that water quality standards issues can be addressed in the most effective and resource-efficient manner.

**Comment #44**

As currently included in the Implementation Plan, the cost analysis is inadequate and fails to accurately characterize the costs associated with complying with the mandates of the proposed TMDL and associated targets. Analyses prepared by the stakeholders in the watershed show that the costs of compliance with the proposed TMDL Implementation Plan and TMDL targets will likely exceed the costs set forth in the Regional Board's cost analysis.

**Response #44**

See Response #15.

**Comment #45**

One example of underestimated costs of compliance is contained in Section 9.0, Economic Considerations, Table 9.2. Restricting or suspending grading activities during the wet season results in direct costs for the carrying capacity of any given acre of land. Based on average current real estate values within the San Diego Creek Watershed, CICWQ estimates that on a per acre basis, the additional carry costs that can be expected to be incurred by developers in the watershed during a 6-month wet weather grading ban range from \$62,500 to \$125,000 per acre. This assumes land costs within the watershed vary between \$500,000 and \$1,000,000 per acre and includes costs associated with pre-acquisition, due-diligence, entitlement, acquisition, financing, and pre-construction costs. This cost range also reflects a realistic average project internal rate of return that can vary between 20 and 30 percent.

**Response #45**

The RWQCB is prohibited from specifying the manner of compliance with its regulations. Dischargers subject to the proposed TMDLs and wasteload/load allocations are

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

responsible or identifying compliance strategies, and conducting the requisite CEQA analysis of implementation of the selected strategies at the project level. Table 9.2 includes a list of foreseeable methods of compliance with the OCs TMDLs. There is no statement in Table 9-2 (or anywhere else in the recommended TMDLs) that restriction, suspension, or banning of grading activities during wet weather is a necessary implementation measure. One foreseeable method of compliance listed in the table is to schedule grading activities to reduce erosion potential during the rainy season. The California Stormwater Quality Association (CASQA) Scheduling fact sheet (EC-1) from their BMP handbook (see Appendix D in the November 17, 2006 OCs TMDLs technical report) recommends that major grading operations be scheduled during dry months *when practical*. The fact sheet also states that the cost effectiveness of construction scheduling techniques to reduce sediment erosion should be compared with other less effective erosion and sedimentation controls to achieve a cost effective balance.

**Comment #46**

A second example of underestimated and outdated cost analysis is the cost associated with the planning, installation, maintenance and operation, testing, and removal of advanced stormwater treatment systems that are capable of capturing, treating, and filtering fine sediment before stormwater is released from any given site. CICWQ has been in contact with project developers and builders, advanced treatment vendors, and consulting engineers who specify, operate, and maintain erosion and sediment control systems that might be considered “Advanced Treatment” to obtain realistic and current system costs. CICWQ’s research conducted in December 2006 to January 2007 suggests that the Board has seriously underestimated the cost of compliance with the proposed implementation plan and depending upon the total volume of water to be treated over a 6-month wet season, the cost to capture, contain, treat, and filter stormwater can be as much as \$20,000 per acre (not including the cost of compliance monitoring using appropriate sampling protocols and California state certified laboratories). Numerous factors must be considered in specifying treatment system costs and key sensitivities include the volume of water to be treated over the wet season, basin sizing to accommodate filtration and settling for the volume of water to be handled on site (most systems can treat a maximum of 1800 gallons per minute), basin construction characteristics (lined v. unlined) and type of polymer used to coagulate fine sediment. This per acre cost is above and beyond costs already incurred by project developers for stormwater control, which in 2006 (CICWQ research) range from \$2,000 to \$5,000 per acre.

**Response #46**

As stated in Response 45, the RWQCB is prohibited from specifying the manner of compliance with its regulations. Dischargers subject to the proposed TMDLs and wasteload/load allocations are responsible for identifying compliance strategies. Section 8.3.4 of the November 17, 2006 OCs TMDLs technical report states that BMPs, including advanced treatment BMPs (ATBMPs), should be evaluated to determine which BMPs are more appropriate and more effective at reducing or eliminating discharges of OCs and other pollutants associated with fine sediments from construction sites. Currently, there is no requirement to use ATBMPs at construction sites, but they should be evaluated along with other more traditional BMPs to determine which ones are most effective at reducing or

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

eliminating pollutants associated with fine particulates. Any BMP evaluation would consider cost effectiveness as well.

Comment #47

Because the TMDL targets as proposed are set as such low levels, and as discussed in our previous technical comments, at scientifically unsupportable levels, it will be virtually impossible for the Regional Board and the regulated community to determine if TMDL targets are met. In addition, the determination of whether or not TMDL targets are met appears to be unrelated to whether or not beneficial uses are impaired. In fact, as detailed above, available information indicates that beneficial uses are not currently impaired as a result of OCs. Although the Regional Board staff has indicated that they are taking a pragmatic approach with regard to the implementation of the OCs TMDL it will be impossible to do so because the water quality targets are set at levels that are so low they cannot be measured. Therefore, additional studies will not establish compliance with the targets, and pragmatic implementation measures will not be sufficient as a matter of regulatory interpretation.

Response #47

As indicated in prior responses (e.g., Responses #1 and 6), the scientific validity of the proposed numeric targets/TMDLs has been confirmed by three independent expert peer reviewers, State Board staff and USEPA. See Response # 42 regarding the assertion of no beneficial use impairment due to organochlorine compounds.

Analytical laboratories are very responsive to the need to lower method detection limits when regulatory limits require detections of compounds at lower and lower concentrations (e.g., laboratories can now routinely detect selenium at concentrations lower than the CTR chronic freshwater criterion of 5 µg/L). EPA Method 8270 can be used for analysis of OC pollutants in sediment and fish tissue. However, one of the problems with EPA Method 8270 is that it is not a very sensitive method for toxaphene analysis (Rich Gossett, CRG Marine, electronic mail dated August 9, 2007; Attachment I). This is because toxaphene is a mixture of several hundred compounds and it tends to fragment during analysis so much of the analytical signal can be lost.

Another method currently being used to detect total toxaphene in sediment and fish tissue, which overcomes some of these limitations, is Negative Ion Chemical Ionization (NICI or NICI) gas chromatograph mass spectrometer (GCMS). The use of NICI is allowed as part of EPA method 8270 and can detect toxaphene at concentrations below the TMDL numeric target for sediment of 0.1 ppb (Rich Gossett, CRG Marine, e-mail dated August 9, 2007; Attachment I). The cost for NICI analysis per sample is not substantially higher than the cost per sample for the traditional EPA Method 8270 analysis (e.g., \$200/sample for traditional Method 8270 analysis versus \$250/sample for the NICI analysis).

The development and implementation of a comprehensive, watershed-wide work plan (Task 7 of the recommended implementation plan) if pursued by the stakeholders, will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence at a public hearing) TMDL implementation tasks, taking economic

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

considerations into account, and to assure that implementation responsibilities are properly apportioned.

**Comment #48**

To inform its policy decisions about the feasibility of incorporating numeric effluent limits into stormwater permits, the State Water Resources Control Board ("State Board") convened a Blue Ribbon Panel to take a look at the issue. In June 2006 the Blue Ribbon Panel issued its report entitled "*Storm Water Panel Recommendations to the California State Water Resources Control Board on The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 19, 2006)" ("Blue Ribbon Panel Report"). As part of its discussion and recommendations, the Blue Ribbon Panel observed that active treatment technologies involving the use of polymers with large storage systems now exist that can provide much more consistent and very low discharge turbidity. Blue Panel Report, p. 15. It also observed that "toxicity has been observed at some locations" and "[t]here is always the potential for an accidental large release of such chemicals with their use." *Id.* The Blue Ribbon Panel stated, "[i]n considering widespread use of active treatment systems, full consideration must be given to whether issues related to toxicity or other environmental effects of the use of chemicals has been fully answered and that "[c]onsideration should be given to longer-term effects of chemical use, including operational and equipment failures or other accidental excess releases." *Id.* at p. 17.

Here, the Regional Board is basically requiring the incorporation of advanced treatment technologies as part of the OCs TMDL Implementation Plan without adequately considering the factors noted in the Blue Ribbon Panel Report as critical to determining if advanced treatment is appropriate. Further, the Regional Board is moving forward with a requirement of advanced treatment without allowing the State Board sufficient time to consider and respond to the Blue Ribbon Panel's recommendations. These are complicated issues that are of state-wide concern and importance. It is arbitrary and capricious for the Regional Board to move forward with mandating advanced treatment as part of the Implementation Plan for the OCs TMDL without considering the factors noted in the Blue Ribbon Panel Report and without allowing the State Board to address the recommendations of the Blue Ribbon Panel with respect to advanced treatment on a statewide basis. The Regional Board should defer to the policies that the State Board will set in its upcoming (Spring 2007) renewal of the General NPDES Permit for Construction Activities.

**Response #48**

See Response #46. The proposed TMDLs/implementation plan does not, and the Regional Board cannot, dictate the method or manner of compliance with the TMDLs or other requirements of the Board. The proposed implementation plan states that improvements to the Storm Water Pollution Prevention Plan (SWPPP) program are necessary, including the evaluation of additional BMPs, including enhanced BMPs, to determine those that may be appropriate for reducing or eliminating organochlorine compound discharges from construction sites. As shown in Attachment 2 to Resolution No. R8-2007-0024, Sec. 4.b.3., Task 4, language has been added to reflect the need to consider the potential adverse environmental consequences of enhanced BMPs as well as their efficacy in reducing fine particulate discharges containing organochlorine compounds. The proposed

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

implementation plan requires the MS4 permittees to evaluate BMPs that are most effective for reducing/eliminating organochlorine compounds discharges, and to consider the potential for adverse environmental impacts in this evaluation process. This evaluation program is to be conducted in accordance with a plan and schedule approved by the Regional Board's Executive Officer. A report of the investigations is to be submitted, with a plan and schedule for implementing the BMP recommendations and incorporating the BMPs in relevant guidance manuals. That plan/schedule is to be implemented upon the Executive Officer's approval.

**Comment #49**

The Implementation Plan as currently proposed fails to take into account site specific considerations with respect to the presence of OCs in the watershed, and improperly assumes that all sites in the watershed had prior agricultural use and thus have the potential to contribute OCs. This approach will result in substantial compliance costs being expended at sites where there is no history of the use of OCs. Thus, we recommend, at a minimum, that the Implementation Plan include a threshold site assessment process to determine the extent of the presence of OCs at sites so as to determine if individual sites have the potential to cause or contribute to the loading of OCs. Such an approach will be more efficient and effective so as to direct efforts to control OCs to sites that have the potential to contribute to the loading of OCs in the watershed rather than mandating that all sites implement certain measures based on the improper, unfounded assumption that all sites in the watershed will cause or contribute to exceedances of OCs. The Regional Board August 2006 Staff Report contained a similar provision, albeit flawed through the specification of a detection-based analytical approach, that should be fully explored and included in the Implementation Plan as an area of special study to be performed before mandating region-wide implementation of expensive and unproven stormwater treatment technologies, that may result in toxic discharges.

**Response #49**

See Response #48; contrary to the commenter's assertion, the recommended TMDLs/implementation plan does not mandate region-wide implementation of any specific compliance mechanism, including stormwater treatment technologies. The proposed implementation plan includes tasks (e.g., Task 3 and 5) designed to assess sources of organochlorine compounds in the Newport watershed. These tasks must be considered for inclusion in the comprehensive Work Plan (Task 7), if this approach is pursued by watershed stakeholders. The phased TMDL approach is intended to allow for these source investigations and for refinement of the TMDLs, including the wasteload and load allocations, if demonstrated to be appropriate.

With respect to construction, provided that appropriate method detection limits are used and sufficient samples are collected to characterize a site, there is no reason why OC pollutant concentrations in site soils cannot be assessed prior to the start of construction activities. If OC pollutants are found, then a determination can be made as to whether it is more cost effective to remove the contaminated soils or to implement appropriate BMPs to prevent the migration of potential OC pollutants offsite. This is a common sense approach that does not require prior authorization by the TMDLs implementation plan.

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

**Comment #50**

The California Supreme Court has concluded that a regional board must take into account the factors listed in Water Code section 13241 and relevant case law when adopting standards that are more stringent than federally imposed standards. *City of Burbank v. State Water Resources Control Board* (2005) 35 Cal.4th 613. The proposed TMDL targets are more protective than, and thus exceed federally mandated requirements (i.e., the levels contained in the California Toxics Rule (CTR)) and go beyond the standards imposed by the Clean Water Act. Therefore, an analysis under Water Code section 13241 is required in order to adopt such targets. In contrast, the stakeholder proposed or corrected targets submitted in the County of Orange matrix on January 12, 2007 provide suggested TMDL targets that are consistent with and that would be required to achieve CTR limits, which are mandated by federal law.

Cal. Water Code section 13241 requires that the Regional Board consider a number of factors in its adoption of water quality standards, including economic impacts, environmental characteristics of the region, the need for housing within the region, and the need to develop and use recycled water. The Regional Board has failed to adequately consider these factors in developing the proposed TMDL targets and the Amendment. When this balancing is conducted, it is clear that the proposed TMDL targets should be revised as recommended by the stakeholders to be consistent with the CTR criteria, which are the standards provided by federal law.

**Response #50**

See Response #43. Water Code Section 13241 applies to establishing water quality objectives. It does not apply to establishing TMDLs. Federal law mandates that TMDLs be set at a level that will ensure attainment of the existing water quality standards (including narrative objectives). Establishing numeric targets, or a numeric interpretation of a narrative objective, is not establishing a water quality standard but rather is a necessary step in the implementation of a narrative objective. Even if Section 13241 did apply to these proposed TMDLs, the proposed numeric targets are no more stringent than those employed in USEPA's organochlorine compounds TMDLs, promulgated in 2002. (Regional Board staff's proposed TMDLs are more stringent than those promulgated by the USEPA because EPA failed to use in their calculation the allowable sediment loads identified by the long-established Sediment TMDL for the San Diego Creek/Newport Bay. Regional Board staff correctly implemented established regulation for the watershed by using the allowable sediment loads in calculating the proposed organochlorine compounds TMDLs.)

Review of the available site-specific data for the OC pollutants indicated that establishing the TMDLs based on the statewide CTR numeric criteria alone would not be sufficient to protect the designated uses and attain the narrative toxic substances objective applicable to Newport Bay and its watershed. In order to protect the applicable uses and meet the narrative objective, the most appropriate approach, for these pollutants in this watershed, was to develop TMDLs designed to meet narrative as well as numeric criteria. The propriety of this approach is confirmed by the numeric targets selected by the USEPA in the agency's promulgation of organochlorine compounds TMDLs, which are essentially the same as those used by Regional Board staff. Both Regional Board staff and USEPA staff

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

believe that the OCs TMDLs numeric targets will result in the attainment of water quality standards and beneficial uses in the Newport Bay watershed.

The November 17, 2006 OCs TMDLs technical report discusses in detail in section 3.2.3 why Regional Board staff did not elect to use the EqP method to derive sediment targets from the CTR ambient water quality criteria for OC pollutants (see pages 36 and 37 of the staff report) as certain stakeholders and their consultants have recommended. Some of the problems with the EqP method for calculating protective targets for sediment include 1) it assumes equilibrium conditions, which rarely exist in this watershed; 2) it assumes that aquatic organisms accumulate only pollutants derived from sediment porewater and does not allow for bioaccumulation from ingestion of sediment or other dietary intake (which is the primary route of exposure for most bioaccumulative compounds); 3) sediment targets calculated using this approach are extremely sensitive to the organic carbon fraction in sediment (the percent organic carbon in Bay sediments is extremely variable); and 4) there is substantial uncertainty regarding the octanol water and organic carbon partitioning coefficients ( $K_{ow}$  and  $K_{oc}$ , respectively) used in this approach. Therefore, Regional Board staff found that it was more appropriate to use sediment- or tissue- based numeric targets for developing and implementing OCs TMDLs. Again, USEPA staff also agrees with this approach; it is the same approach USEPA used in the technical TMDLs for toxic pollutants in the San Diego Creek/Newport Bay watershed (USEPA 2002).

**Comment #51**

The Regional Board must comply with the California Environmental Quality Act ("CEQA") when amending its Basin Plan. *City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392. This includes an analysis of the environmental impacts associated with the proposed action, including cumulative impacts and mitigation measures, as well as alternatives to the proposed action. *Id.* at 1422.

There are a number of impacts associated with the Amendment and its foreseeable implementation measures that must be analyzed pursuant to CEQA. Cal. Pub. Res. Code § 21002; Cal. Code Regs., tit. 14, §§ 15187; 15252; *Sierra Club v. Board of Forestry*, 7 Cal.4th 1215; *City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392. There are a number of reasonably foreseeable implementation measures, such as implementation of open space BMPs, increased dredging, implementation of additional sediment control BMPs that go beyond large sediment basins, and advanced treatment "BMPs," that must be analyzed to determine the potentially significant environmental impacts associated with these measures. All of these reasonably foreseeable implementation measures are likely to result in environmental impacts that CEQA requires be analyzed and considered by the Regional Board. *Id.*

There is a major flaw and CEQA inadequacy in the Regional Board's Attachment B Environmental Checklist because the Checklist improperly defers analysis of the impacts of the implementation or mitigation measures and the details of the mitigation measures. The Checklist takes the approach that impacts of the measures will be analyzed later, with project-specific CEQA analysis. While CEQA and case law recognize that, in some instances, all construction level details of mitigation measures may not be available, CEQA does not allow complete deferral of analysis of mitigation measures (see Cal. Code Regs.,

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

tit. 14, § 15126.4 and in particular, § 15126.4, subdivisions (a)(1)(B) and (a)(1)(D)). To be adequate under CEQA, there must be a commitment to mitigation, mitigation criteria, and “alternatives to be considered, analyzed, and possibly incorporated in the mitigation plan.” *Defend the Bay v. City of Irvine* (2004) 119 Cal. App. 4<sup>th</sup> 1261, 1275.

Examples of potential impacts of the implementation measures include, with respect to dredging, likely temporary aesthetic and noise impacts, biological impacts and water quality/hydrology impacts, just to name a few. Further, incorporation of additional open space BMPs as a result of the Implementation Plan is likely to result in aesthetic impacts and potential biological impacts on the nature reserve of Orange County, including its species and their habitat. The utilization of large regional sediment basins are also likely to have significant water quality and biological impacts, as were noted by the Regional Board in its May 30, 2003 comment letter on the Irvine Ranch Water District’s Natural Treatment System Environmental Impact Report. See e.g., comments 26-28. Other environmental impacts associated with the reasonably foreseeable implementation measures of the OCs TMDL include air quality impacts associated with requiring the compaction of grading schedules to accomplish grading solely during the dry season, and impacts associated with potential displacement of planned housing and adverse impacts to the jobs/housing balance in the region associated with these grading restrictions.

CEQA requires that the Regional Board prepare an analysis of the reasonably foreseeable impacts arising from the reasonably foreseeable methods of compliance with an adopted performance standard that takes into account any economic and technical factors related to compliance. Cal. Pub. Res. Code § 21159; Cal. Code Regs., tit. 14, § 15126.6; *City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392.

**Response #51**

A Substitute Environmental Document (SED) (July 25, 2007) has been prepared and circulated for review in accordance with CEQA (Attachment B to the September 7, 2007 supplemental staff report). The SED describes the CEQA requirements that pertain to the consideration of the proposed Basin Plan amendment to incorporate the recommended organochlorine compounds TMDLs. The SED then provides the analyses required to comply with those requirements. An additional document, Findings of Fact and Statement of Overriding Considerations for the SED/TMDLs, complements the SED and together these documents/analyses satisfy relevant CEQA requirements.

**Comment #52**

CEQA also requires that the Regional Board analyze alternatives to the proposed action, including the “no-action” alternative. Cal. Pub. Res. Code § 21002; Cal. Code Regs., tit. 14, §15252(a). Here, the Regional Board has failed to adequately analyze alternatives to the proposed action and it must do so to comply with CEQA. The substitute environmental document must evaluate the “No Project” alternative. Cal. Code Regs., tit. 14 § 15126.6, subd. (e). The Staff Report briefly discusses the “No Project” alternative, but, does not explain whether the baseline for determining impacts is the same as the existing environmental setting. For purposes of the No Project alternative and existing regulatory conditions/environmental setting, the document must consider “what would be reasonably expected to occur in the foreseeable future ...based on current plans.” Cal. Code Regs.,



**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

tit. 14, § 15126.6, subd. (e)(2). The Staff Report does not recognize that what would be reasonably expected to occur in the foreseeable future is that is highly likely that no further action will be needed. This is because the available evidence shows that concentrations of these compounds have declined tremendously and will continue to decline in the future, since their use ceased long ago. In addition, there is no evidence of acute or chronic toxicity caused by these compounds.

Response #52

See Response #51.

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**Robert Caustin**  
**Defend the Bay/NRDC**

Comment #53

Defend the Bay and the Natural Resources Defense Council are very concerned about the continuing delay in moving forward with the implementation of the TMDL for organochlorines, including DDT, DDE and chlordane. We write to urge the Board to move forward with TMDL implementation now.

This TMDL was adopted in 2002—over four years ago. Since that time, the Regional Water Quality Control Board has been under an affirmative obligation to implement its requirements, but it has failed to do so. Instead, the Board has invested its limited resources in reconsidering the TMDL. This is not consistent with the Board's duty to implement the Basin Plan pursuant to 40 C.F.R. Part 130.6. This approach to TMDL implementation is circular and it omits the critical step: actual implementation to protect the region's waters.

Response #53

Comment noted. The public hearing for consideration of adoption of the TMDLs, with an implementation plan as required by the Water Code, is scheduled for September 7, 2007. Regional Board staff appreciates Defend the Bay's and NRDC's support for adoption and implementation of the OCs TMDLs.

Comment #54

The Objections submitted by the Irvine Company, working in concert with the County of Orange, intend to further delay clean-up of pernicious toxins like DDT, DDE, and chlordane. There are numerous problems with submissions and objections like these, which include but are not limited to the following:

- When a waterway is listed as impaired on a 303(d) list, a TMDL must be approved and implemented. 33 U.S.C. Section 1313(d); 40 C.F.R. Part 130.7. "Reports" like that submitted by the Irvine Company and the County of Orange, which merely attempt to take issue with factual findings that have been made previously about impairment and have not been timely challenged, are legally beside the point. Here, the issues raised at the 11<sup>th</sup> hour by the Irvine Company and the County should not be considered.

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

- Even a cursory review of the “Report” submitted by the Irvine Company, and the other “concerns” raised by the stakeholders, show that they are based on an effort to make every possible factual assumption, and resolve every single are of possible uncertainty, in a manner that favors not implementing the adopted TMDL and not adopting a revised TMDL.
- Likewise, sediment data is dismissed with bald assertions that this data should be set aside because it was collected by different agencies and because, it is asserted, sediment moves in and out of the Bay.
- Much the same, concentrations in excess of the effects range median (ERM) are dismissed with the statement that the ERM is flawed.
- Indeed, as a whole, the objections raised now are flimsy and of a speculative nature. Such assertions—and this tack generally—simply do not overcome the substantial evidence in the record that shows that the conclusion of impairment is valid and appropriate. They ignore also that the Regional Board has a duty in developing and implementing a TMDL to make conservative assumptions and include a margin of safety.

In short, stakeholders objecting to water quality improvement here ask the Regional Board to ignore its obligations, further delay an already-delayed TMDL, and permit the TMDL program to be nothing more than a circular series of studies and counter-studies. The Board should resist this approach and should move forward with the TMDL post haste.

**Response #54**

Regional Board staff is required to consider all comments and submittals regarding the TMDLs up to the time of Regional Board consideration of the TMDL Basin Plan amendment at a public hearing. The public hearing for consideration of adoption of the TMDLs is scheduled for September 7, 2007; therefore, comments on the OCs TMDLs can be submitted until then. Written responses to comments submitted at least two weeks prior to the hearing date will be provided at the public hearing.

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***Mary Lynn Coffee, Nossaman, Guthner, Knox & Elliott, LLP for  
Orange County Great Park Corp/Heritage Fields LLC.***

**Comment #55**

The Staff Report characterizes MCAS El Toro as a point source for OCs TMDLs. It is our contention that the MCAS El Toro site is being characterized as a point source solely because that characterization provides a convenient category for referencing the regulatory status of the property based upon prior and/or current issuance of NPDES permits for discharges at the site. We must request that the record clarify that the characterization in the Staff Report is not intended as a physical characterization of the site as a point source.

Clearly based on the definition provided in the NPS Guidance and NPS Implementation Policy, urban and construction runoff, including construction phase and post-redevelopment urban runoff from MCAS El Toro is, from a physical standpoint, a nonpoint source. In

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

addition, based on the available regulatory guidance, discharges of runoff from MCAS El Toro are more properly characterized as nonpoint sources of pollution for purposes of TMDL development and other regulatory purposes, even if under some circumstances they are subject to NPDES permitting requirements as “point sources.”

**Response #55**

As reflected in the comment, discharges to surface waters resulting from groundwater remediation activities at the MCAS El Toro site are regulated under NPDES permit issued by the Regional Board. In addition, MCAS El Toro is currently being developed for commercial and residential urban uses. These activities are or will be regulated under the statewide National Pollutant Discharge Elimination System (NPDES) general construction permit and the Orange County NPDES Storm Water permit for urban runoff. While it is recognized that stormwater and nuisance water runoff from the MCAS El Toro site, and future urban development at the site, have diffuse and diverse origins consistent with the traditional definition of nonpoint sources, regulation of discharges of pollutants associated with construction/urban runoff are now regulated under NPDES permit, pursuant to federal regulation. Therefore, urban runoff, including construction and post-development runoff, is no longer considered nonpoint source, but is now classified as a point source.

The rationale for the Great Park’s emphasis on the distinction between point and non-point sources is not clear. In either case, parties responsible for discharges from the MCAS El Toro site would be required to implement steps to assure that organochlorine compounds loadings from the site do not cause or contribute to violations of the recommended TMDLs, if approved.

**Comment #56**

As discussed in the Fuscoe Report, it is not appropriate to characterize the MCAS El Toro site as a “substantial threat to water quality” due to extensive assessment and cleanup operations conducted by the Department of the Navy pursuant to oversight of, and subject to approvals of, regulatory agencies with jurisdiction, including not only the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC), but more importantly, the Regional Board. The presence of widespread contamination of pesticides or PCBs on the MCAS El Toro site is extremely unlikely, due to the ongoing and proper remediation of all potential sources and knowledge of spills and releases. Fuscoe Report, pp. 2;4.

**Response #56**

The remediation goals in soils at MCAS El Toro are much higher than the TMDL numeric targets. For example, the Final Remedial Action Report for IRP Site 11 at the former El Toro military base (2006) states the target cleanup goal was 288 µg/kg for Aroclor 1260; 2950 µg/kg for 4,4'-DDD; 2090 µg/kg for 4,4'-DDE; 2090 µg/kg for 4,4'-DDT; and 2030 µg/kg for alpha-chlordane. These values are all substantially higher than the TMDL sediment targets for San Diego Creek (34.1 µg/kg for total PCBs, 6.98 µg/kg for total DDT, and 4.5 µg/kg for total chlordane). This implies that if erosion and sediment transport to surface waters from remediated spill sites occur, the residual pollutant concentrations in discharged sediments may be high enough to pose a substantial threat to water quality, even after cleanup goals for particular sites have been met. (See also Response #57

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

below, and Response #55 in Attachment C5 to the September 7, 2007 supplemental staff report).

Comment #57

MCAS El Toro is being remediated to allow for conversion and re-use primarily for recreational, educational, institutional, and open space uses, as well as for some transit-oriented and residential development. These conversions and re-use activities have occurred pursuant to Findings of Suitability for Transfer (FOSTs), as described in some detail in the attached Fuscoe Report. Prior to transfer, and in connection with the issuance of the FOSTs, written concurrence is provided by the regulatory agencies (EPA, DTSC, and the Regional Board) that no further action is required for sites to be transferred and converted to post-military uses. The FOSTs and no further action determinations allow transfer for re-use, which has already occurred for the majority of parcels within MCAS El Toro, and these regulatory do not exclude conversion activities (demolition and construction) necessary to achieve reuse. Based on these documents, regulatory agencies, including the Regional Board, have already determined remediation is sufficient for both conversion and re-use.

Response #57

The actions discussed above occurred prior to the promulgation of USEPA's 2002 technical TMDLs for Toxic Constituents in the San Diego Creek and Newport Bay watersheds and did not consider water quality impacts that might occur from erosion and transport of soils offsite during grading, construction, and other post-development activities. The clean-up levels against which soil samples were compared (see page 4 of the Fuscoe report and page 55 of the November 17, 2006 OCs TMDLs technical staff report) are residential preliminary remediation goals (PRGs). EPA Region IX makes the following statements about PRGs on their web site (<http://www.epa.gov/region09/waste/sfund/prg/faq.htm>):

*"PRGs (Preliminary Remediation Goals) for the Superfund/RCRA programs are risk-based concentrations, derived from standardized equations combining exposure information assumptions with EPA toxicity data. They are considered by the Agency to be protective for humans (including sensitive groups), over a lifetime. **However, PRGs are not always applicable to a particular site and do not address non-human health endpoints such as ecological impacts.**"[emphasis added]*

The PRGs used at MCAS El Toro are substantially higher than the TMDL sediment numeric targets (see table below), which were selected to protect the most sensitive beneficial uses in the watershed including wildlife. Therefore, even though contaminated soils at the site were left at PRG concentrations, there still exists the potential for contaminants to migrate from the site due to erosion and transport via storm water runoff.

Contaminant	Residential PRG (µg/kg)	TMDL Sediment Numeric Target (µg/kg)
Chlordane	1600	4.5    6.98 (as total DDT)
DDD	2400	
DDE	1700	
DDT	1700	

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

Contaminant	Residential PRG (µg/kg)	TMDL Sediment Numeric Target (µg/kg)
PCBs	3900	34.1
Toxaphene	440	0.1

**Comment #58**

We also suggest that it is inappropriate and inequitable to require current owners and developers of property to undertake expensive measures to control/eliminate runoff of legacy pollutants deposited onsite by the Navy and other historical users, rather than simply requiring the prior users to remediate to a level sufficient to protect water quality from the site's stormwater runoff. CERCLA offers protection for current owners and operators of contaminated property that did nothing to contribute to the contamination and have taken appropriate measures with respect to the contamination.

**Response #58**

Task 5 in the proposed TMDL Implementation Plan has been modified (see Attachment 2 to Resolution No. R8-2007-0024, section 4.b.3.) to specify that if the results of source evaluations indicate that additional OCs soil remediation is necessary on MCAS El Toro, the responsible parties for such remediation will be identified. The responsible party (-ies) will be tasked to implement those portions of the BMP plan identified for the responsible party (-ies) for MCAS El Toro. The proposed implementation plan also recognizes that review and, possibly, revision of the TMDLs will be necessary based on the results of these and other implementation tasks (see Task 10, Phase II Implementation).

**Comment #59**

The Staff Report acknowledges that there is no documented relationship between OCs and PCBs from MCAS El Toro and loading to San Diego Creek and Newport Bay. For example, page 55 of the Staff Report notes that may “be implied” that organochlorine compounds used at MCAS El Toro in the past will pollute the Upper Newport Bay. Furthermore, the Staff Report states that two studies are being conducted that “should lead to a better understanding of the relative pollutant contributions from different land uses” (page 51). Thus the Staff Report characterizes MCAS El Toro as a source of OCs, while at the same time acknowledging that MCAS El Toro may not be a source. We respectfully request that the Regional Board consider whether the most productive allocation of limited public funds would be toward efforts and implementation measures designed to definitively determine the cause of toxicity in the watershed, rather than toward further controls for sites that are already subject to regulatory oversight and approval before release for conversion and re-use.

**Response #59**

Board staff believes that the commentor seriously misrepresents the statements in the November 17, 2006 OCs TMDLs technical staff report. The sentence referred to on page 55 of the technical report states: “This implies that if erosion and sediment transport to surface waters from remediated spill sites occur, the residual pollutant concentrations in discharged sediments may be high enough to pose a substantial threat to water quality, even after cleanup goals for particular sites have been met” [emphasis added]. The technical staff report characterizes both MCAS Tustin and El Toro as potential sources of

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

OC pollutants based on actual base documents, but acknowledges that further investigation is necessary. No other PCB spills in the San Diego Creek watershed have been documented other than those reported at these military bases.

The purpose of the two studies mentioned on page 51 of the technical staff report is to link OC pollutant loads with specific land uses (agricultural, urban, construction, industrial, etc.). These studies and their purpose are described in more detail in Section 8.2 of the technical staff report (see study nos. 3 and 4 on pages 83 and 84 of the staff report). The study by the Southern California Coastal Water Research Project (SCCWRP) has been completed. A copy of their Technical Report No. 512 can be found at <http://www.sccwrp.org/pubs/techrpt.htm>. This peer-reviewed study found that of the land uses investigated (agricultural, commercial/industrial, residential, and construction—including completed grading and grading in progress), the average storm water concentration of total PCBs at construction sites was an order of magnitude greater than any other land use examined.

As stated previously (see Responses #56 and 57), while the MCAS El Toro site may have been judged as being sufficiently remediated for the purposes of residential and commercial occupation by humans, that analysis did not consider that pollutants left in place could pose a threat to downstream water quality and beneficial uses if erosion and sediment transport to surface waters from these sites were to occur.

The revised Basin Plan Amendment (BPA) (Attachment 2 to Resolution No. R8-2007-0024) provides the opportunity for development of a comprehensive work plan for the watershed that will address organochlorine compound pollutants as well as other potential sources of toxicity in the watershed. The work plan approach, if pursued by the stakeholders, would include an early task to establish an Independent Advisory Panel (IAP) of objective, qualified scientists who will help to evaluate and address areas of remaining uncertainty in the OCs TMDLs, and provide guidance and recommendations on the prioritization and appropriateness of the TMDL implementation tasks so that water quality standards issues can be addressed in the most effective and resource-efficient manner. The TMDL implementation plan includes recommendations for special studies to evaluate potential sources of sediment toxicity in both San Diego Creek and Newport Bay (see Attachment 2 to Resolution No. R8-2007-0024, Sec. 4.b.3, Task 9).

**Comment #60**

Modeled construction OCs loads for MCAS El Toro demonstrate that with deployment of construction BMPs, construction runoff will not adversely affect implementation of proposed load allocations or beneficial uses. The Geosyntec Report concludes that sediment loadings can be sufficiently limited as necessary to achieve load allocations through proper design, implementation, and maintenance of construction site BMPs required under the General Construction Permit and DAMP, including implementation of construction phase sediment basins.

A Stormwater Pollution Prevention Plan (SWPPP) that incorporates appropriate erosion and sediment BMPs, including those discussed above, will be required by the City of Irvine for the development of the Great Park and Heritage Fields. In addition, pursuant to its

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

obligations under the City's water quality ordinance, and under the general municipal storm drain permit ("MS4 Permit"), both the City and the Regional Board will oversee and enforce the proper implementation of construction BMPs to control sediment and erosion. As a result, and as has been demonstrated through modeling, construction and demolition activities within the MCAS El Toro site cannot realistically be expected to mobilize or release sufficient loads of OCs to pose a "substantial threat to water quality." Therefore we request amendment of these conclusions prior to Regional Board consideration of the Amendment.

**Response #60**

The Geosyntec report estimated loadings OC pollutants in construction site runoff using limited data to compare to the construction allocations in the OCs TMDLs. Better information is needed regarding OCs soil residues within the MCAS El Toro site for comparison to the TMDL sediment numeric targets. The accuracy, applicability, and conservativeness of Geosyntec's estimates of potential OC discharges from construction activities on the base cannot be judged without more information regarding the rainfall intensities and durations used, the location and distribution of the soil samples referenced, and a clearer picture of both how Geosyntec derived their numbers and of the actual contaminant concentrations in soils on the base. During extremely intense storms or storms of long duration, routine BMPs may not be effective in controlling sediment discharges; therefore, improvements to current BMPs and BMP implementation on construction sites are needed.

As the commenter is aware, the General Construction Permit (Order No. 99-08-DWQ), regulates storm water and non-storm water discharges from construction sites. This statewide general permit requires that best management practices (BMPs) be implemented that use best available technology economically achievable (i.e., BAT/BCT standard) to achieve an effective combination of erosion and sediment control. In 2005, Regional Board staff issued Notices of Violation (NOVs) for lack of an effective combination of erosion and sediment controls and other violations of the General Permit at two large construction sites in the City of Irvine. The NOVs stated that because of inadequate BMPs, sediment-laden storm water flowed into the storm drain system and adjacent drainages. Because these sites were being developed on lands previously in agricultural land use, it is likely that the transported sediments carried with them a certain amount of adsorbed legacy OC pesticides. Regional Board staff has similar concerns regarding construction activities on the former military bases where OC contaminants have been identified in soils. Task 4 of the recommended TMDL implementation plan (Section 4.b.3 of the proposed Basin Plan amendment (Attachment 2 to Resolution No. R8-2007-0024) describes implementation actions that Regional Board staff believe are needed in order to address these concerns.

As stated previously (see Responses #56 and 57), while the MCAS El Toro site may have been judged as being sufficiently remediated for the purposes of residential and commercial occupation by humans, that analysis did not consider that pollutants left in place could pose a threat to downstream water quality and beneficial uses if erosion and sediment transport to surface waters from these sites were to occur. The use of effective erosion and sediment control measures to address this potential threat and assure that

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

OCs loads in MCAS El Toro construction phase runoff will not impact surface waters, should assure compliance with the OCs TMDLs.

Comment #61

Dr. Byard analyzed the potential for the estimated OCs loads predicted in the Geosyntec Report to present a direct or indirect threat to human health or wildlife as a result of direct exposure or bioaccumulation. Dr. Byard's analysis concludes that runoff from the site does not pose a risk to human health or to wildlife, due to potential for direct or indirect exposure due to bioaccumulation.

Response #61

Regional Board staff reviewed the Geosyntec (see Response #60) and Byard reports. For his wildlife hazard assessment, Dr. Byard does not compare the total DDT and Chlordane concentrations estimated by Geosyntec (41 ppb and 0.6 ppb, respectively – it should be noted that the method Geosyntec used to adjust the surface soil data to current conditions is not addressed in their report) to the OCs TMDLs sediment numeric targets, but instead uses an equilibrium partitioning (EqP) method to derive his sediment numeric target for DDT (45 ppb) and Chlordane (90 ppb). Dr. Byard's targets are much higher than the TMDL numeric sediment targets for DDT (6.98 ppb) and Chlordane (4.5 ppb).

The November 17, 2006 OCs TMDLs technical report discusses in detail in section 3.2.3 why Regional Board staff did not elect to use the EqP method to derive the TMDL sediment targets (see pages 36 and 37 of the staff report). Some of the problems with the EqP method for calculating protective targets for sediment include 1) it assumes equilibrium conditions, which rarely exist in this watershed; 2) it assumes that aquatic organisms accumulate only pollutants derived from sediment porewater and does not allow for bioaccumulation from ingestion of sediment or other dietary intake (which is the primary route of exposure for most bioaccumulative compounds); 3) sediment targets calculated using this approach are extremely sensitive to the organic carbon fraction in sediment (the percent organic carbon in Bay sediments is extremely variable); and 4) there is substantial uncertainty regarding the octanol water and organic carbon partitioning coefficients ( $K_{ow}$  and  $K_{oc}$ , respectively) used in this approach.

Dr. Byard's human health hazard assessment also relies on the EqP method. Since the CTR human health criteria are already based on a lifetime cancer risk of  $10^{-6}$ , it is not clear why Dr. Byard adds in an additional  $10^{-5}$  or  $10^{-4}$  cancer risk to his calculations. Regional Board staff's calculations of a sediment target for the protection of human health using the CTR human health criterion would be 28 ppb, not 265 ppb (Byard's  $10^{-5}$  cancer risk calculation) or 1,486 ppb (Byard's  $10^{-4}$  cancer risk calculation). However, for the reasons already stated, Regional Board staff elected not to use the EqP method to develop sediment numeric targets or the OCs TMDLs (in this case, OEHHA's 1999 screening values were used for the human health sediment numeric targets; OEHHA's draft screening values cannot be used since they may change before they are formally adopted by OEHHA (Dr. Robert Brodberg, OEHHA, electronic mail dated May 4, 2006; Attachment I) and the State Listing Policy does not allow the use of draft criteria).



***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Dr. Byard does not provide complete calculations in his report, his report and calculations have not been subject to peer review, as required by the State Listing Policy, and other commenters have suggested that Regional Board staff's numeric sediment targets are in fact not stringent enough to adequately protect sensitive species in the watershed, such as California Least Terns. Reliance on Dr. Byard's recommended targets would not be, in staff's view, sufficient to protect beneficial uses and thus would be inadequate to the purpose of the TMDLs. (See also Attachment C1 for responses to Dr. Byard's comments in the Flow Science, Inc. reports).

**Comment #62**

To confirm the conclusions of the Geosyntec Report and the Byard Report, and to improve information regarding OCs residues within the MCAS El Toro site, the Great Park, and Heritage Fields, LLC have conducted, and plan to conduct additional baseline runoff monitoring for OCs that will further characterize OCs loads in runoff under existing conditions. By using finer detection limits to measure OCs residues than were used to collect the currently available remediation data, the Great Park can confirm the conclusions in the Geosyntec and Byard reports prior to commencement of construction within the MCAS El Toro site.

**Response #62**

Regional Board staff appreciates the Great Park and Heritage Fields, LLC efforts to assess the extent of OC pollutant contamination remaining at MCAS El Toro. Regional Board staff looks forward to reviewing the study results once they are completed.

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***Dr. Jack Skinner, Stop Polluting Our Newport  
E-mail dated January 13, 2007***

**Comment #63**

I am writing the Regional Board to express my support for the proposed Resolution. I have significant concerns about the continuing high levels of Total DDT found in the tissue of forage fish taken from both Upper and Lower Newport Bay in August and September of 2002.

The DDT findings were published by Dr. James Allen, et al., in 2004. The study is entitled "Bioaccumulation of Contaminants in Recreational and Forage Fishes in Newport Bay, California in 2000-2002." Dr. Allen was commissioned by the Regional Board to perform the study. I am attaching a copy of his findings. Please note the high levels of DDT presented in the column labeled "Total DDT" outlined by a black margin. All composite fish samples show DDT levels well above the total DDT residue guideline (TRG) of 14 micrograms per kilogram, a standard published by Environment Canada in 2000 in order to protect fish-eating avian species from the reproductive effects of DDE. DDE, a derivative of DDT, is found in high levels in Newport Bay fish. Each composite sample tested by Dr. Allen included very large numbers of fish (See column labeled "Composite"). Also note that all the fish samples, including California killifish, pacific staghorn sculpin, arrow goby, California halibut, topsmelt, black perch, and the diamond turbot, show high levels of total

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

DDT, frequently more than 10 times the TRG established by Environment Canada. It surprised me that such young forage fish already had significantly elevated levels of total DDT compounds indicating to me that they had recently been exposed to an environment with unacceptable levels of DDT, mostly in the form of DDE.

Response #63

Regional Board staff appreciates Dr. Skinner's support for the adoption of the OCs TMDLs. Dr. Allen's fish tissue data (Allen et al., 2004) were used in staff's impairment assessment for the OCs TMDLs. Regional Board staff used the National Academy of Sciences (NAS) guidelines for comparison of whole fish tissue for the protection of wildlife and the Office of Environmental Health Hazard Assessment (OEHHA) 1999 screening values for comparison of fish muscle fillets for protection of human health. The NAS and OEHHA guidelines were used instead of the Environment Canada tissue residue guidelines (TRGs) because the 2004 State Listing Policy recommends the use of the NAS and OEHHA guidelines for impairment assessments. Impairment due to excessive DDT and PCBs concentrations in fish tissue were found for both wildlife and human health (see Section 2.0 and Appendix B of the November 16, 2007 OCs TMDLs technical report).

Comment #64

I have read Dr. Byard's report for the Irvine Company entitled "DDT Analysis for the Newport Bay Watershed." The report states on page 11, "Dr. Byard concludes that the TRG [established by Environment Canada] was based on several questionable assumptions that led to an erroneous value that is too low." The questionable assumptions that Dr. Byard is challenging are: 1) the selection of the wrong bird species to study; 2) the use of eggshell thinning rather than hatching failure; and 3) the daily intake of fish rather than periodic fish consumption. Dr. Byard's arguments do not assuage my concerns about the high total DDT levels found in forage fish by Dr. Allen that are many times higher than the standard set by Environment Canada. I don't think that the high Newport Beach levels of total DDT can be ignored.

Response #64

Regional Board staff solicited responses to Dr. Byard's assertions from several experts. Their responses to Dr. Byard's commentaries, which are attached to the Flow Science, Inc. November 20, 2006 reports, can be found in Attachment D. Regional Board staff's responses to the Flow Science reports can be found in Attachment C1.

Comment #65

I believe that Dr. Byard's concerns about the Environment Canada standard will be addressed by the studies outlined in the proposed Phased Organochlorine TMDL. I don't believe that Dr. Byard's concerns should lead the Regional Board to vote against this proposed revision of the Organochlorine TMDL prepared by the Regional Board staff.

Response #65

Comment noted.

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

Comment #66

The levels of DDT documented in Dr. Allen's report indicate that fish in the ecological reserve are still being exposed to excessive levels of DDT compounds, presumably located in the sediments carried down San Diego Creek into the Bay during storm events.

Response #66

The degree to which fish are being exposed to OC contaminants absorbed to sediments that are being carried from the upper portions of the watershed to Newport Bay versus the contribution of these contaminants from sediments that are re-circulated from within the bay, has not been determined. The OCs TMDLs implementation plan recommends that a special study be conducted to address this issue (see Task 9 (5) in Attachment 2 to Resolution No. R8-2007-0024)

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***Dr. Jack Skinner, Stop Polluting Our Newport  
E-mail dated February 9, 2007***

Comment #67

I disagree with Dr. Byard's opinion that a TMDL that further limits DDT loads in Newport Bay is unjustified. A study by Dr. James Allen contains recent findings of DDT high levels in Newport Bay forage fish and Dr. Martha Sutula found abnormal clapper rail egg findings attributed to DDT. Dr. Martha Sutula stated that the concentrations of DDE found in all six clapper rail eggs at concentrations exceeding the lower range of the level of concern for biotic effects in omnivore waterfowl, suggesting that DDT could be contributing to their reproductive impairment in Upper Newport Bay. Drs. Allen and Sutula's findings are strong reasons to need a phased TMDL proposed by Board staff.

Response #67

Regional Board staff agrees with Dr. Skinner's comment.

Comment #68

Dr. Byard has contended that the TMDL targets are erroneous because they are derived from various guidance and criteria documents that he contends are flawed and used questionable data and assumptions. Dr. Byard's challenge to many existing DDT standards argue for the Regional Board to vote for phased TMDLs since it is structured after the selenium TMDL and would initiate appropriate studies to resolve these issues. A scientific review panel could be convened to determine if it is appropriate to change the DDT standards by establishing a site-specific objective. A board composed of scientists (including USGS and USFWS) could be formed to determine the need to develop new national standards for DDT that are more appropriate for protecting the environment from the effects of DDT. I respectfully request that the Regional Board support phased TMDLs for the organochlorine compounds.

Response #68

Revisions to the OCs TMDLs Basin Plan Amendment (BPA) include more emphasis on developing a collaborative, flexible and comprehensive Work Plan that will prioritize and

**Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs**

implement TMDL tasks such as monitoring, source assessment, biological impact evaluations, remediation, and toxicity source assessments in Newport Bay (Task 7 of the proposed implementation plan). If this Work Plan approach is pursued by the stakeholders, an Independent Advisory Panel (IAP) composed of a group of objective, qualified, scientific experts (similar to that convened by the Nitrogen and Selenium Management Program) will be established to help address/resolve areas of uncertainty and to direct and advise on implementation tasks. The development and implementation of a comprehensive, watershed-wide Work Plan will allow the stakeholders to evaluate, prioritize, and potentially revise (with Regional Board concurrence) TMDL implementation tasks, so that potential water quality and beneficial use benefits as well as their associated costs can be appropriately considered.

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**Paul Singarella, Latham & Watkins LLP for  
The Irvine Company**

Comment #69

The ongoing process whereby the water bodies are recovering naturally from legacy pesticides should be given serious consideration as a long-term remedy and implementation measure. Regional Board staff acknowledge that natural recovery is occurring in this watershed, and can by itself achieve the TMDLs' goals. See, e.g., draft Basin Plan Amendment, page 8 ("Natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay...[N]atural attenuation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations....").

Outside experts engaged by the stakeholders concur with the Regional Board staff's conclusion. The consulting firm Quantitative Environmental Analysis ("QEA") conducted a study of DDT data from Newport Bay, and determined that DDT concentrations rapidly have declined in these water bodies, continue to do so today, and will continue to decline in the future. For example, data show that the concentration of DDT as measured in red shiner fish and mussels decline by half every four to five years. QEA's rigorous statistical analysis concluded there is much less than a one percent chance that the decline observed in the data is some random artifact of the data. Stated another way, QEA concludes there is about a 99.95 percent probability that DDT concentrations in the watershed are declining due to real processes as the data suggests.

Response #69

Board staff have commented on the adequacy of the QEA report (see Attachment C1, Response #3). While Board staff believes, as stated in the comment, that natural attenuation should *eventually* reduce organochlorine compounds concentrations to acceptable levels, the issue that remains is how long that will require. Data adequate to demonstrate that natural attenuation alone will be sufficient to prevent impairment due to organochlorine compounds in a timely manner are not available at the present time. If, as TMDL implementation progresses, through the Work Plan approach or otherwise, it can be demonstrated that natural attenuation will in fact suffice to achieve the purpose of the

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

TMDLs in a timely manner, then the TMDLs/implementation plan can be revised accordingly. Further, additional investigation may demonstrate that delisting of one or more of the pollutant/waterbody combinations is appropriate, obviating the need for one or more TMDLs.

**Comment #70**

As this TMDL concerns contaminated sediment, Regional Board staff should look to USEPA guidance on remedies for contaminated sediment. USEPA acknowledges that natural attenuation is a remedy that must be examined alongside other potential actions, such as dredging, as it can be the environmentally superior choice. See USEPA, Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, Dec. 2005, EPA-540-R-05-012, chapter 4.

**Response #70**

See Response #69.

**Comment #71**

Regional Board staff and stakeholder experts agree that natural recovery is achieving significant reductions in DDT as measured in the biota. We respectfully request that natural recovery, consistent with USEPA policy, be given due consideration prior to the Regional Board requiring stakeholders to implement any costly, large-scale remedial measures, such as dredging or treatment systems.

**Response #71**

The stakeholders have the opportunity provided by the integrated Work Plan approach (Task 7 of the recommended implementation plan) and/or by other investigations, to demonstrate that natural recovery will be an effective alternative to timely meet the objective of the TMDLs to achieve water quality standards. The Regional Board cannot dictate the method or manner of compliance with the TMDLs; the proposed implementation plan cannot, and does not, dictate that large scale remedial treatment systems be implemented.

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***Carolyn Lobell, Nossaman, Guthner, Knox & Elliott, LLP for  
Lennar Heritage Fields and Shea Tustin Legacy Community Partners***

**Comment #72**

Task 1 and Task 2 of the Draft Basin Plan Amendment call for status reports that assess compliance with final numeric effluent limitations. We understand that during the period of Work Plan implementation, these compliance reports will take into account findings, determinations and recommendations of the Independent Advisory Panel and the status of the Work Plan implementation as of the date of the compliance report.

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

**Response #72**

The language in Tasks 1 and 2 speaks to annual assessments of the status of compliance with the final limitations that will be included in permits to implement the wasteload/load allocations. As stated in these tasks, a schedule of compliance with these limitations will be specified, pursuant to the compliance schedule authorization provided by the TMDLs, once incorporated in the Basin Plan. The permits will specify that compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

The permits will specify that, for Working Group members, participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Compliance with these interim performance based-limits will clearly need to be judged based on status reports and/or other evidence of adherence to the Work Plan tasks and schedules.

**Comment #73**

With respect to Draft Basin Plan Amendment (BPA) Tasks 1, 2, 3, 4, 5, and 8(2) as applied to Working Group participants, provisions in all general and individual NPDES permits, waivers, conditional waivers and other Regional Board orders and approvals will specify that effective implementation of the Work Plan constitutes compliance with interim performance-based effluent limitations, and strict compliance with numeric TMDL targets and waste load allocations will not be required prior to completion of the Work Plan tasks and implementation period, unless it is determined during Work Plan implementation that earlier compliance is possible and feasible.

**Response #73**

Permits and other regulatory actions by the Regional Board to implement the TMDLs, if and when approved, will include requirements necessary to implement the wasteload and load allocations. As stated in Response # 72, compliance with these requirements (not numeric targets) will be required prior to the completion of the Work Plan tasks if such earlier compliance is demonstrated to be reasonably feasible.

**Comment #74**

As a part of Task 5, parties responsible for soils remediation in MCAS Tustin and El Toro will be identified if determined appropriate under the sources investigation plan called for by the Task. Table NB-OCs-13 and BPA pp. 25-26. We understand that in the event that it is determined appropriate, not only parties and remediation efforts that are subject to NPDES Permits and WDRs, but also parties and remediation efforts that are subject to Regional Board oversight and approvals will be required to participate in the Working Group or to conduct activities in compliance with the TMDLs, and its numeric targets, WLAs and LAs. Similarly, we understand that for non-Working Group Members, implementation of BMPs to reduce or eliminate sources of OCs or PCBs identified pursuant to Task 5 can commence not only upon issuance of appropriate 13267 letters or revisions of applicable permits, but also via imposition of conditions on remediation programs, plans or approvals conducted

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

pursuant to Regional Board oversight and approval. Working Group Members would implement such BMPs pursuant to the Work Plan.

**Response #74**

There is no requirement to participate in the Working Group. The proposed implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3., Task 7) provides the opportunity for the formation of the Working Group and the development, and implementation upon Regional Board approval, of a comprehensive, integrated Work Plan designed to address organochlorine compound and other water quality problems affecting Newport Bay and its watershed. As stated in Task 7, Working Group members must consider each of the tasks identified in the implementation plan (except Tasks 1 and 4) in developing the Work Plan. Note that the language in Section 4.b.3., page 28 (Task 7) has been revised to clarify expectations with respect to consideration of the implementation plan tasks. These changes were made in response to the request for clarification by other stakeholders. The relevant excerpt is shown below, with the added language underlined:

“It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 (except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements) must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal. In addition, consideration shall be given to the following: “

All responsible parties, whether or not they are Working Group members will be required, through permits, Water Code Section 13267 letters or other regulatory actions by the Regional Board as necessary, to take appropriate steps to implement the TMDLs. As described, for example, in Task 1, the manner in which those requirements will be implemented will vary depending on whether or not the responsible party is a Working Group member.

**Comment #75**

Task 10 as specified in Table NB-OCs-13 and on pages 32 and 33 of the Draft Basin Plan Amendment provides that appropriate activities for the task include evaluation of Phase I implementation effectiveness, consideration of whether more stringent BMPs may be necessary, and consideration of whether modifications to the TMDLs, including numeric targets, WLAs and LAs or delisting is warranted pursuant to established Sediment quality Objectives, new data or results of special studies. Although not expressly stated, we understand that new data and results of special studies are likely to be generated pursuant to recommendations of the Independent Advisory Panel and via the Work Plan.

**Response #75**

Regional Board staff's expectation is that the Independent Advisory Panel will provide recommendations regarding numeric targets, the conduct of special studies and other

***Attachment C6 - Response to Local Stakeholder Group Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

technical aspects of the TMDLs. Implementation of the Work Plan is likewise expected to provide relevant new data that can be used to refine the TMDLs/implementation plan.

Comment #76

Due to authority provided under the TMDL to develop a Work Plan, subject to Regional Board review, that phases implementation measures and tasks, for Working Group members, TMDLs, WLAs, LAs and other targets do not become enforceable numeric limitations or other regulatory standards, such as ARARs or PRGs, prior to completion of the Work Plan, unless compliance is determined feasible and possible at an earlier time.

Response #76

The manner in which interim and final effluent limitations necessary to implement applicable wasteload and load allocations will be specified in permits issued by the Regional Board is delineated in Task 1 of the implementation plan (Attachment 2 to Resolution No. R8-2007-0024, sec. 4.b.3). For Working Group members, final limitations based on the allocations would be required no later than December 31, 2015, but earlier compliance may be required by the Executive Officer if it is demonstrably reasonably feasible to do so.

Comment #77

The implementation measures identified in the SED (including ATS and dredging) are not sufficiently refined at this point to fully analyze the potentially significant adverse environmental impacts associated with their implementation, including significant adverse biological impacts, and water quality impacts). Additional CEQA analysis of these measures will therefore be required prior to implementation of these measures, and is anticipated in part to occur as a part of the Work Plan.

Response #77

As stated in section 1.1 of the SED, the SED analysis is intended to serve as a first tier environmental document. The SED is not required to conduct project-level analysis. (Pub. Resources Code, Section 21159(d).) Project-specific CEQA analysis must occur, as required, when specific projects are identified to achieve the TMDLs. The Work Plan is expected to identify a plan for actions to be taken to achieve the TMDLs.



***Attachment C7 – List of References Cited in Responses to Comments  
San Diego Creek/Newport Bay Organochlorine Compounds TMDLs***

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## **List of Acronyms, Abbreviations and Units Used in Responses to Comments**

ACOE – United States Army Corps of Engineers  
ATBMPs – Advanced Treatment Best Management Practices  
BAF – Bioaccumulation Factor (the amount of a compound that an organism accumulates in its tissues from diet and water)  
BAT – Best Available Technology Economically Achievable  
BCF – Bioconcentration Factor (the amount of a compound that an organism accumulates in its tissues from water)  
BCNH – Black-Crowned Night Heron  
BCT – Best Conventional Pollutant Control Technology  
BEDS – Biological Effects Database for Sediments  
BIOL – Biological habitat of special significance beneficial use designation  
BMF – Biomagnification Factor (the amount a compound increases in an organisms tissues with each step in trophic level)  
BMP – Best Management Practice  
BPA – Basin Plan Amendment  
BPJ – Best Professional Judgment  
BPT – Best Practicable Control Technology Currently Available  
BPTCP – Bay Protection Toxic Cleanup Program  
BRPE – Brown Pelican  
BSAFs – Biota-Sediment Accumulation Factors  
BW – body weight  
CASQA – California Stormwater Quality Association  
CDFG – California Department of Fish and Game  
CEQA – California Environmental Quality Act  
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)  
CGC – Chiral Gas Chromatography  
CMB – Chemical Mass Balance  
COCs – Contaminants of Concern  
CSIA – Compound-Specific Isotope Ratio Analysis  
CTR – California Toxics Rule (USEPA, 2000)  
CV – Coefficient of Variation  
CWA – Clean Water Act  
DAMP – Orange County Drainage Area Management Plan  
DCCO – Double-Crested Cormorant  
DDD – Dichlorodiphenyldichloroethane (isomer of DDT)  
DDE – Dichlorodiphenyldichloroethylene (isomer of DDT)  
DDT – Dichlorodiphenyltrichloroethane  
DDTr – Total DDT  
DFG – California Department of Fish and Game  
Dioxin TCDD – 2,3,7,8-Tetrachlorodibenzo-p-dioxin  
DoD – Department of Defense  
DOI – United States Department of the Interior  
DTSC – California Department of Toxic Substances  
DWQ – California Department of Water Quality  
EPA – United States Environmental Protection Agency

ERL – Effects Range Low  
 ERM – Effects Range Median  
 EqP – Equilibrium Partitioning Method  
 EST – Estuarine habitat beneficial use designation  
 FDA – United States Food and Drug Administration  
 FOST – Findings of Suitability for Transfer  
 FWS – United States Fish and Wildlife Service  
 GBHE – Great Blue Heron  
 GC/ECD - Gas Chromatography-Electron Capture Detector  
 GC-MS – Gas Chromatography-Mass Spectrometry  
 g/yr – Grams per year  
 IAP – Independent Advisory Panel  
 in – Inches  
 IRP – Installation Restoration Program  
 kg - Kilogram  
 $K_{oc}$  – Octanol partition coefficient (ratio of the concentration of a chemical in *n*-octanol at equilibrium at a specified temperature)  
 $K_{ow}$  – Octanol-water partition coefficient (ratio of the concentration of a chemical in *n*-octanol and water at equilibrium at a specified temperature)  
 LA – Load Allocation  
 LARWQCB – Los Angeles Regional Water Quality Control Board  
 LETE – Least Tern  
 LOEC – Low Observable Effects Concentration  
 LOEL – Low Observable Effects Level  
 $m^3$  – Cubic meters  
 $m^3/y$  – Cubic meters per year  
 MAR – Marine habitat beneficial use designation  
 Max - Maximum  
 MCAS – Marine Corps Air Station  
 MESL – MacDonald Environmental Services Limited  
 mg/kg – Milligrams per kilogram (parts per million)  
 mg/L – Milligrams per liter (parts per million)  
 Min    Minimum  
 MS4 – Municipal Separate Storm Sewer System  
 NAS – National Academy of Sciences  
 NCI – Negative Ion Chemical Ionization  
 NDs – Non-Detections  
 ng/kg – Nanograms per kilogram (parts per trillion)  
 ng/L – Nanograms per liter (parts per trillion)  
 NICI – Negative Ion Chemical Ionization  
 NIMS – Negative Ion Mass Spectroscopy  
 NOAA – National Oceanic and Atmospheric Administration  
 NOEC – No Observable Effects Concentration  
 NOEL – No Observable Effects Level  
 NOV – Notice of Violation  
 NPDES – National Pollutant Discharge Elimination System  
 NPS – Non-Point Source  
 NRDC – National Resource Defense Council

NSMP – Nitrogen and Selenium Management Program  
 OAL – Office of Administrative Law  
 OCs – Organochlorine compounds (e.g., organochlorine pesticides and PCBs)  
 OEHHA – California Office of Environmental Health Hazard Assessment  
 OIG – Office of the Inspector General  
 PAHs – Polycyclic Aromatic Hydrocarbons  
 PAM - Polyacrylamide  
 PBDE – Polybrominated Diphenyl Ether  
 PCBs – Polychlorinated Biphenyls (e.g., Arochlors)  
 PECs – Probable Effects Concentrations  
 PELs – Probable Effects Levels  
 PMF – Positive Matrix Factorization  
 ppb – Parts per billion  
 ppm – Parts per million  
 ppm ww – Parts per million wet weight  
 pptr – Parts per trillion  
 PRGs – Preliminary Remediation Goals  
 QEA – Qualitative Environmental Analysis  
 $R^2$  – Coefficient of Determination  
 RARE – Rare, threatened or endangered species beneficial use designation  
 RCRA – Resource Conservation and Recovery Act  
 RDMD – Orange County Resources and Development Management Department  
 RMA – Resource Management Associates  
 RMP – Regional Monitoring Program  
 RWQCB – Regional Water Quality Control Board  
 SADC – Santa Ana-Delhi Channel  
 SARWQCB – Santa Ana Regional Water Quality Control Board  
 SCCWRP – Southern California Coastal Water Research Project  
 SECs – Sediment Effect Concentrations  
 SED – Substitute Environmental Document  
 SFEI – San Francisco Estuary Institute  
 SHEL – Shellfish harvesting beneficial use designation  
 SMW – State Mussel Watch program  
 SPWN – Spawning, reproduction and development aquatic habitat beneficial use designation  
 SQGs – Sediment Quality Guidelines  
 SQOs – Sediment Quality Objectives  
 State Board – California State Water Resources Control Board  
 State Listing Policy – 2004 Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List  
 Std – Standard Deviation  
 SVs – Screening Values  
 SWAMP – Surface Water Ambient Monitoring Program  
 SWPPP – Storm Water Pollution Prevention Plan  
 SWRCB – State Water Resources Control Board  
 TAC – Technical Advisory Committee (refers to OCs TMDLs TAC convened during TMDL development)  
 TC – Tissue Concentration



TEC – Threshold Effects Concentration  
TEF – Toxicity Equivalent Factor  
TELs – Threshold Effect Levels  
TEQ – Toxicity Equivalent Quotient  
TIEs – Toxicity Identification Evaluation Procedures  
TMDL – Total Maximum Daily Load  
TOC – Total Organic Carbon  
TRG – Tissue Residue Guideline  
TRVs – Toxicity Reference Values  
TSMP – Toxic Substances Monitoring Program  
TTRL – Threshold Tissue Residue Level  
UC – University of California  
UNB – Upper Newport Bay  
USACOE – United States Army Corps of Engineers  
USEPA – United States Environmental Protection Agency  
USFWS – United States Fish and Wildlife Service  
USGS – United States Geological Survey  
 $\mu\text{g/g}$  – Micrograms per gram (parts per billion)  
 $\mu\text{g/kg}$  – Micrograms per kilogram (parts per billion)  
 $\mu\text{g/kg dw}$  – Micrograms per kilogram dry weight (parts per billion)  
 $\mu\text{g/kg ww}$  – Micrograms per kilogram wet weight (parts per billion)  
 $\mu\text{g/L}$  – Micrograms per liter (parts per billion)  
WDRs – Waste Discharge Requirements  
WILD – Wildlife habitat beneficial use designation  
WLA – Waste Load Allocation